DVD-Video Player

DVD 960

DVD960 / 001

Service
Service
Service

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Service Manual

CLASS 1
LASER PRODUCT

DVD VIDEO

COMPACT disc DIGITAL VIDEO

COMPACT disc DIGITAL AUDIO

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PHILIPS

1. Technical specifications

SPECIFICATIONS

PLAYBACK SYSTEM
DVD-Video
Video CD
CD (CD-R and CD-RW)

OPTICAL READOUT SYSTEM

Laser type	Semiconductor
Numerical Aperture	0.60 (DVD)
	0.45 (VCD/CD)
Wavelenght	650 nm (DVD)
	780 nm (VCD/CD)

DVD DISC FORMAT

Medium	Optical Disc	
Diameter	12cm (8cm)	
Playing time	(12cm)	
	Single layer	2.15 h*
	Dual layer	4 h*
	Two side, single layer	4.30 h*
	Two side, dual layer	8 h*

TV STANDARD	**EUROPE** (PAL/50Hz)	**USA** (NTSC/60Hz)
Number of lines	625	525
Playback	Multistandard	

VIDEO FORMAT

DA Converter	10 bits
Signal handling	Components
Digital Compression	MPEG2 for DVD, MPEG1 for VCD

DVD	**50Hz**	**60Hz**
Horiz. Resolution	720 pixels**	720 pixels**
Vertical Resolution	576 lines	480 lines

VCD		
Horiz. Resolution	352 pixels	352 pixels
Vertical Resolution	288 lines	240 lines

VIDEO PERFORMANCE

Video output	1 Vpp into 75 ohm
S-Video output	Y:1 Vpp into 75 ohm
	C:0.300 Vpp into 75 ohm
RGB output	0.7 Vpp into 75 ohm
YUV output	Y:1 Vpp into 75 ohm
	U:0.7 Vpp into 75 ohm
	V:0.7 Vpp into 75 ohm
Video Shift	Left/Right

AUDIO FORMAT

Digital	MPEG 2, AC-3	Compressed Digital
	DTS	
	PCM	16,20,24 bit
		fs, 48, 96 kHz

Analog sound Stereo
Dolby Pro Logic™ downmix from multi channel sound
3D Sound for virtual 5.1 channel sound on 2 speakers

AUDIO PERFORMANCE

DA Converter	24 bits, 96 kHz	
DVD	f_s 96 kHz	4 Hz - 44 kHz
	f_s 48 kHz	4 Hz - 22 kHz
Video CD	f_s 48 kHz	4 Hz - 22 kHz
CD	f_s 44.1 kHz	4 Hz - 20 kHz
Signal-Noise (1kHz)		113 dB
Dynamic Range (1kHz)		113 dB
Crosstalk (1kHz)		120 dB
Distortion and Noise (1kHz)		-97 dB

CONNECTIONS

SCART	Euroconnector
YUV (YcrCb)	Cinch
CVBS	Cinch
S-Video	Mini DIN, 4 pins
Audio L+R output	Cinch
Digital Output	1 coaxial, 1 optical
	IEC958 for CDDA / LPCM
	IEC1937 for MPEG1/2, AC-3, DTS

POWER SUPPLY

Power Inlet	220V, 50Hz
Power consumption	20Watt
Power consumption standby	
	less than 5 Watt

CABINET

Dimensions	430 x 95 x 275 (w x h x d)
Weight	5 Kg

PACKAGE CONTENTS
DVD-Video Player
Remote Control with batteries
Power cable
User Manual
SCART cable
Audio cable
Video cable

GENERAL FUNCTIONALITY
Stop/Play/Pause
Fast Forward/Backward (3-speed)
Step Forward
Slow (3-speed)
Title/Track Select
Skip Next/Skip Previous
Repeat (Chapter/Title/All) or (Track/All)
A-B Repeat
Shuffle
Scan
3D Sound (on/off)

DVD FUNCTIONALITY

Multi-angle Selection	
Audio Selection	(1 out of max. 8 languages)
Subtitles Selection	(1 out of max. 32 languages)
Aspect Ratio conversion	(16:9, 4:3 Letterbox, 4:3 Pan Scan)
Disc Menu support	(Title Menu and Root Menu)
Resume	(5 discs) after stop/standby
Screen Saver	(Dim 75% after 15 min.)
Disc lockout	

VIDEO CD FUNCTIONALITY
Playback Control for VCD 2.0 discs
Resume (5 discs) after stop/standby
Screen Saver (Dim 75% after 15 min.)
Disc lockout

AUDIO CD FUNCTIONALITY
Time Display (Total/Track/Remaining Track Time)
Full audio functionality with remote control
Favourite Track Selection (FTS)

* typical playing time for movie with 2 spoken languages and 3 subtitle languages.

** equivalent to 500 lines on your TV

2. Warnings and Laser safety instructions

(GB) **WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) **WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor elektrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) **ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise a leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller a ce que les composants ainsi que les outils que l'on utilise soient également a ce potentiel.

(D) **WARNUNG**

Alle IC und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern.
Sorgen sie dafür, das Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(I) **AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevita potrebbe essere fortemente ridatta in caso di non osservazione della piu grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt terug gebracht en dat onderdelen, identiek aan de gespecifieerde worden toegepast.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten.
Der Originalzustand des Gerats darf nicht verandert werden.
Fur Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimessonelle condizioni originali e che siano utilizzati pezzi di ricambiago idetici a quelli specificati.

(F)

Les normes de sécurité exigent que l'appareil soit remis a l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom,
Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.
Ref.UL Standard NO.1492.

NOTE ON SAFETY:

Symbol ⚠ : Fire or electrical shock hazard. Only original parts should be used to replace any part with symbol ⚠
Any other component substitution(other than original type), may increase risk or fire or electrical shock hazard.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne."

LASER SAFETY

This unit employs a laser. Only a qualified service person should remove the cover or attempt to service this device, due to possible eye injury.

LASER DEVICE UNIT

Type:	SemiconductorlaserGaAlAs
Wave length:	650 nm (DVD) 780 nm (VCD/CD)
Output Power:	7 mW (DVD) 10 mW (VCD/CD)
Beam divergence:	60 degree

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURE OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

AVOID DIRECT EXPOSURE TO BEAM

WARNING

The use of optical instruments with this product will increase eye hazard.
Repair handling should take place as much as possible with a disc loaded inside the player

WARNING LOCATION: INSIDE ON LASER COVERSHIELD

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VARNING SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN
VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETSEN
DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Warning for powersupply on position 1005

The primary side of the powersupply including the heatsink carries live mains voltage when the player is connected to the mains even when the player is swiched off !
This primary area is not shielded so it is possible to touch copper tracks and/or components when servicing the player. Service personnel have to take precautions to prevent touching this area or components in this area .
The primary side of the powersupply has been indicated with a lightning stroke and a stripe-marked printed on the printed wiring board

Note:
The screws on the basic Engine (position 81 in on the exploded view drawing) may never be touched removed or re-adjusted.
Handle the Basic engine with care when the unit has to be exchanged!
The mechanism of the basic engine is very sensative for droping or shocks

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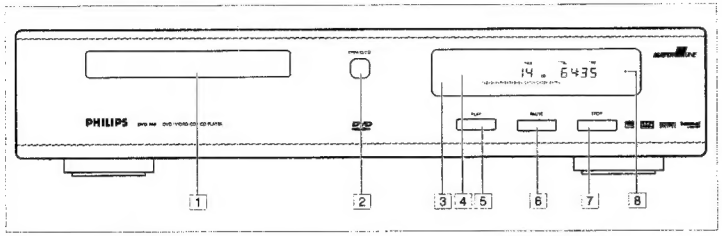
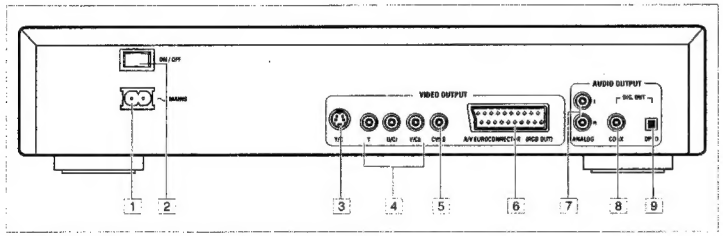


FRONT OF PLAYER

1 Disc loading tray
2 Tray OPEN/CLOSE key
3 Display
4 Remote control sensor
5 PLAY key
6 PAUSE/Still, Step key
7 STOP key
8 Standby indicator



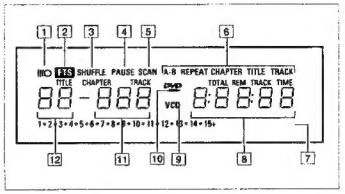
REAR OF PLAYER

1 Power supply
2 ON/OFF
3 S-Video
4 Component video (YUV); Video output
5 Video (CVBS); Video output
6 A/V Euroconnector
7 Audio R; Audio output R
Audio L; Audio output L
8 Coaxial Digital audio output
9 Optical Digital audio output

CAUTION
Do not touch the inner pins of rear-panel connectors. Electrostatic discharge may cause permanent damage to the unit.

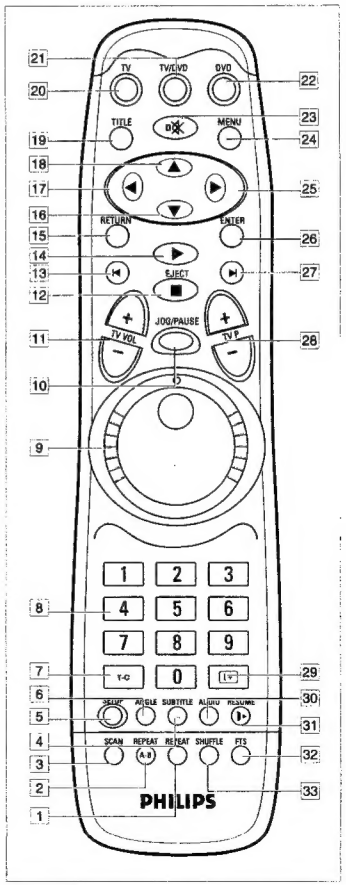
DISPLAY

1 Remote control active (flashing)
2 FTS (Favourite Track Selection) active
3 SHUFFLE active
4 PAUSE active
5 SCAN active
6 A-B REPEAT/CHAPTER/TITLE/TRACK mode active
7 Chapter or track calendar
8 TOTAL/REMaining/TRACK TIME in hours, minutes and seconds
9 (V)CD disc inserted
10 DVD disc inserted
11 DVD CHAPTER or VCD/CD TRACK number
12 DVD TITLE number



REMOTE CONTROL

1 **REPEAT** (chapter, track, title, disc)
2 **A-B REPEAT**
3 **SCAN** On/Off
4 **SUBTITLE** language selector or Subtitle On/Off
5 **SETUP** Select player settings menu (in Stop mode only)
6 Select DVD camera **ANGLE**
7 **T-C**; mode selector Title/Chapter
8 Numerical key pad
9 Jog/shuttle control
10 **JOG/PAUSE** (On/Off)
11 **TV VOL**ume (Up/Down)
12 **STOP** ■ or **EJECT**
13 **PREVIOUS** I◄ /search backward
14 **PLAY** ►
15 **RETURN**
16 Cursor down ▼
17 Cursor left ◄
18 Cursor up ▲
19 **TITLE**; title menu On/Off
20 **TV POWER**
21 **TV /DVD** selector
22 **DVD** /Standby
23 TV Audio **MUTE**
24 **MENU**; root menu On/Off
25 Cursor right ►
26 **ENTER** (acknowledge menu selection)
27 **NEXT** ►I /search forward
28 **TV** Preset (Up/Down)
29 **OSD** (On-Screen Display) on/off
30 **AUDIO** language selector
31 **RESUME** play from last position
32 **FTS** (Favourite Track Selection)
33 **SHUFFLE** on/off



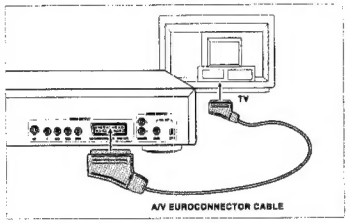
GENERAL NOTE

- *Depending on your TV and other equipment, there are various ways you could connect the DVD-Video player. These are shown below.*

- *Please refer to your TV, VCR, Stereo System and any other User Manual(s) as necessary to make the optimal connections.*

HIGHEST QUALITY A/V CONNECTION

Connection to a TV with an A/V Euroconnector socket



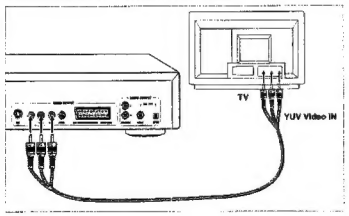
1 Connect the A/V Euroconnector on the rear of the player to the corresponding connector on the TV using the cable supplied.

2 Optionally you can also connect the audio Left and Right channel sockets on the rear of the player to the corresponding sockets on your stereo system.

NOTE

- *Do not connect your DVD-player via your VCR, because the video quality could be distorted by the copy protected system.*

Connection to a TV with YUV sockets



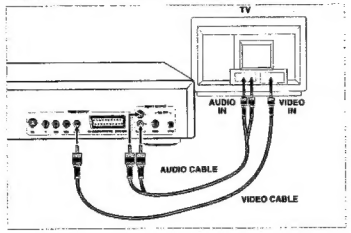
1 Connect the YUV sockets on the rear of the player to the corresponding sockets on the TV using optional cables.

2 Connect the audio left and right channel sockets on the rear of the player to the corresponding sockets on the TV using the cable supplied.

Alternatively, you can use the same cable to connect the audio left and right sockets on the rear of the player to the corresponding sockets on your stereo system.

EXCELLENT A/V CONNECTION

Connection to a TV with a video (CVBS) socket



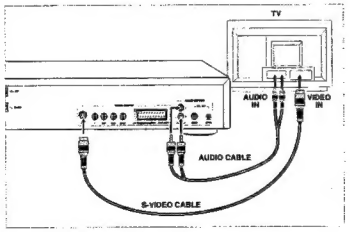
1 Connect the Video socket on the rear of the player to the corresponding socket on the TV using the cable supplied.

2 Connect the audio Left and Right channel sockets on the rear of the player to the corresponding sockets on the TV using the cable supplied. Alternatively, you can use the same cable to connect the audio Left and Right sockets on the rear of the player to the corresponding sockets on your stereo system.

CAUTION

Do not connect the player's audio output to the phono input of your stereo system.

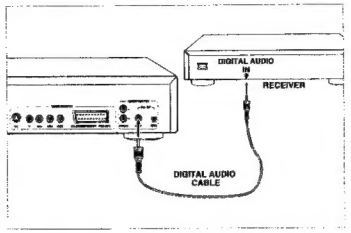
Connection to a TV with a S-Video socket



1 Connect the S-Video socket on the rear of the player to the corresponding socket on the TV using an optional S-Video cable.

2 Connect the audio Left and Right channel sockets on the rear of the player to the corresponding sockets on the TV using the cable supplied. Alternatively, you can use the same cable to connect the audio Left and Right sockets on the rear of the player to the corresponding sockets on your stereo system.

MULTICHANNEL SOUND FOR HOME THEATRE



For multichannel sound, your player provides both digital and analog audio outputs.

DIGITAL (MPEG 2 MULTICHANNEL OR DOLBY DIGITAL™) MULTICHANNEL SOUND

1 For this, which provides the highest multichannel sound quality, you need a digital multichannel A/V receiver.

2 Connect the digital audio output on the rear of the player to a suitable input on the receiver using a digital audio cable (available as option). In this case, do not use the player's audio Left and Right outputs.

3 You will need to activate the digital output of the player.

4 The audio format of the digital output is dependent on the audio format of the selected audio stream. Make sure that the selected audio stream matches the capabilities of the receiver connected to the digital output.

ANALOG (DOLBY PRO LOGIC™) MULTICHANNEL SOUND

1 If your TV set has a Dolby Pro Logic™ decoder, simply hook up the player to the TV using the A/V Euroconnector, or (optional) YUV, or Video (CVBS) and audio connections as on precedent page.

2 If not, make the A/V Euroconnector, or (optional) YUV, or Video (CVBS) connection to the TV, and connect the player's audio Left and Right outputs to suitable inputs on a Dolby Pro Logic™ Audio/Video receiver, using the cable supplied.

3 For speaker connections, follow the instructions given in the TV set or A/V receiver user manual.

NOTE

- *You cannot use the RF Modulator option for home theatre.*

- *If the audio format of the digital output does not match the capabilities of your receiver, the sound will be muted.*

DIGITAL AUDIO (STEREO) SOUND CONNECTION

For this connection, which produces the highest possible stereo sound quality, you need an audio amplifier with digital input, and the digital output of the player must be activated (see Settings). Connect the player's digital audio output to the corresponding input on the amplifier. In this case, do not use the player's audio Left and Right outputs.

CONNECTING THE POWER SUPPLY

1 Plug the female end of the power cord supplied into the Power connector on the rear of the player.

2 Plug the male end of the cord into an AC outlet.

NOTE

- *When the player is in the "OFF" position, it still consumes some power. If you wish to disconnect your player completely from the power supply, withdraw the plug from the AC Outlet.*

CAUTION

Only qualified service personnel should remove the cover or attempt to service this device.

INFRARED REMOTE CONTROL

LOADING THE BATTERIES

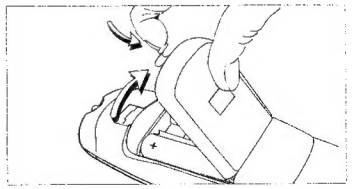
1 Open the battery compartment cover.

2 Insert three 'AA' (R6 or SUM3) batteries as indicated inside the battery compartment.

3 Close the cover.

CAUTION

Do not mix old and new batteries, and NEVER mix different types of batteries (standard, alkaline and so on).



PROGRAMMING THE UNIVERSAL REMOTE CONTROL

The remote control of the DVD-Video player can be programmed to control your Television, Amplifier or Receiver. For the control of these products the following buttons on the remote control are available:

- Amplifier - Volume Up/Down and Audio Mute.
- Receiver - Volume Up/Down and Audio Mute.
- Television - Volume Up, Volume Down, Channel Up/Down and TV Mute.

In order to change the remote control to control your brand of Television, Amplifier or Reciever follow the next steps.

1 Select either your brand of Television, Amplifier or Receiver from the next table. Mark the first 3 digit code number behind the brand name.

2 Press ENTER en RETURN simultaneously until the Jog/Pause button lights up.

NOTE

- Note that your remote control is now disabled for all functions.

3 Enter the digits of the selected 3 digit code number. Every time you enter a digit, the Jog/Pause button will blink shortly. When entering the last (3-rd) digit, the Jog/Pause button will blink twice and then switches off to confirm that the programming sequence was correctly executed.

NOTE

- In case you press a wrong key or an incorrect number, the Jog/Pause button will switch off and flashes once. The remote control has not been re-programmed. Repeat step 1,2 and 3.

4 The remote control is now programmed to control your Television or Amplifier or Receiver. If it does not react properly on the mentioned buttons, select the next 3 digit code number behind the your brand of Television, Amplifier or Receiver and repeat step 2 and 3.

AMPLIFIERS	CODE
Aiwa	431
Grundig	420, 432
Kenwood	428, 447
Marantz	420
Philips	420, 445
Pioneer	401
Sony	415
Technics	423, 434
Yamaha	427

RECEIVERS	CODE
Aiwa	536, 546, 573, 581, 586, 606, 617, 636, 647, 649
Denon	502, 704
Grundig	557, 561, 580
Harman/Kardon	531
JVC	521, 630, 645, 658
Kenwood	510, 523, 589, 590
Luxman	660, 705
Marantz	538, 557, 568
Onkyo	528, 535, 539
Philips	557, 663, 677
Pioneer	582, 645
Sansui	665, 689
Sony	545, 549
Technics	564, 588
Yamaha	596, 551, 681

TELEVISION	CODE
Bang & Olufsen	057,058
Grundig	048, 115, 119, 124, 256, 267, 271
Hitachi	026, 029, 033, 034, 064, 071, 074, 079, 095, 120, 121,134, 137, 139, 160,173, 196, 230, 269, 273, 276
JVC	029, 039, 047, 092, 098, 114, 116, 207
Panasonic	095, 130, 131, 138, 149, 192, 204, 273
Philips	000, 010, 011, 030, 033, 058, 117, 181, 209, 271
Radiola	010, 030, 181
Saba	052, 058, 074, 095, 120, 121, 124, 130, 165, 170, 187, 194, 273

TELEVISION	CODE
Samsung	000, 007, 030, 032, 059, 134, 155, 166, 184, 206, 253, 257
SBR	010, 011, 030, 033, 117
Schneider	011, 030, 135, 148, 172, 181, 188, 197, 207, 221, 268
Sony	001, 008, 009, 029, 075, 253
Telefunken	006, 051, 056, 068, 074, 130, 151, 154, 173, 187, 194, 251, 260
Thomson	074, 120, 121, 124, 165, 170, 186, 194, 196, 223
Toshiba	028, 029, 048, 147, 262, 270

OPERATION

NOTE

- Unless otherwise mentioned, all operations can be carried out with the remote control. Always point the remote control directly at the player, making sure there are no obstructions in the path of the infrared beam.

- When there are corresponding keys on the front panel, they can also be used.

SWITCHING ON

1 Switch on the TV and select the video input for your DVD-Video player.

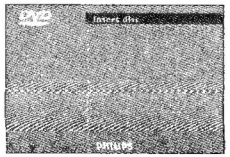
2 To enjoy sound through your stereo system, turn on the system and select the source input for the DVD-Video player.

or

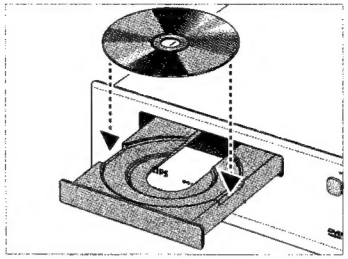
To enjoy DVD-Video with multichannel (surround) sound, switch on the Home Theatre system and select the source input for your DVD-Video player.

3 On the back of the DVD-Video player, press ON/OFF. The player display lights, and the OSD invites you to insert a disc.

4 With Autoplay on (the factory setting) any disc already inserted in the player starts to play.



INSERTING A DISC



1 Press OPEN/CLOSE on the front of the player. The disc tray opens.

2 Lay your chosen disc in the tray, label side up. Make sure it is sitting properly in the correct recess.

3 Gently push the tray, or press OPEN/CLOSE, to close the tray.

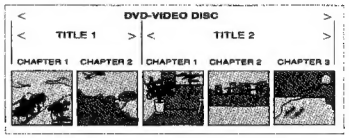
- With Autoplay on (the factory setting) play starts.
- With Autoplay off, the (play) screen for the type of disc inserted appears on the OSD, and information about the disc's contents and total playing time appear on the display.
- To turn Autoplay off or on, see Settings.

NOTE

- Since it is usual for DVD movies to be released at different times in different regions of the world, all players have region codes, and discs can have an optional region code. If you insert a disc of a different region code to your player, you will see the region code notice on the screen. The disc will not play, and should be removed.

PLAYING A DVD-VIDEO DISC

You will recognize DVD-Video discs by the logo. Depending on the material on the disc (a movie, video clips, a drama series, etc.) it may have one or more Titles, and each Title may have one or more Chapters. Play stops at the end of each Title. To make access easy and convenient, your player lets you move between Titles, and also between Chapters.



NOTE

- During play, various icons will appear on the TV screen for about 2 seconds to confirm that a function has been selected. You can get rid of these icons by pressing OSD.

- At any time during play, you can press OSD to call up the Play Banner, which shows you which functions are active, for about 2 seconds. To keep the Play Banner on the screen, hold down OSD for a couple of seconds. To get rid of the Play Banner, press OSD again.

- List of icons:

- ..... Play
- ..... Pause
- ..... Stop
- ..... A-B repeat
- ..... Search forward
- ..... Search backward
- ..... Slow forward
- ..... Repeat disc
- ..... Repeat title
- ..... Repeat chapter
- ..... Chapter shuffle
- ..... Title indication
- ..... Chapter indication
- ..... Disable function
- ..... Angle
- ..... No alternative angle
- ..... Subtitle language
- ..... Audio language

MPEG 2 ch .....Audio system

.....Remaining time of title

.....Elapsed time

.....Resume

.....Total time

PLAYING A TITLE

- With Autoplay on, play starts when you close the disc drawer.
- With Autoplay off, press ▶.

NOTE

- Some DVD-Video discs carry their own Autoplay, in which case play always starts automatically.

- The disc may invite you to select an item from a menu. If the selections are numbered, press the appropriate numerical key; if not, use ▲ ▼ ◀ ▶ to highlight your selection, and press ENTER.
  - ➜ As the disc plays, the player display shows the current title and chapter, and the elapsed playing time.
- Play will stop at the end of a Title and this can result in return to menu. To go on to the next Title, press ▶.
- To stop play at any other time, press ■.
- You can resume play from the point at which you stopped. Press ▶ twice.
- The resume feature applies, not only to the disc in the player, but also to the last four discs you have played. Simply re-insert the disc, press RESUME if Autoplay is off, and when you see the Resume icon on the screen, press ▶ again.

MOVING TO ANOTHER CHAPTER

When a title on a disc has more than one chapter (which you can see from the player display), you can move to another chapter as follows:

- Press ⏭ briefly during play to step forward to the next chapter.
- Press ⏮ briefly during play to return to the beginning of the current chapter. Press ⏮ briefly again to step back to the beginning of the previous chapter.
- To go directly to any chapter, enter the chapter number using the numerical keys.

NOTE

- If the number has more than one digit, press the keys in rapid succession.

- For more information about chapters, see "Checking the contents of DVD-Video discs: Menus".

MOVING TO ANOTHER TITLE

When a disc has more than one title (which you can see from both the OSD and the player display if you press ■), you can move to another title as follows:

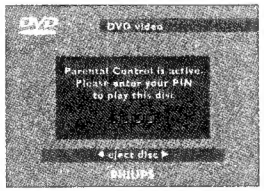
- Press T-C, then press ⏭ briefly during play to step forward to the next title.
- Press T-C, then press ⏮ briefly during play to return to the beginning of the current title. Press ⏮ briefly again to step back to the beginning of the previous title.
- To go directly to any title, press T-C, then enter the title number using the numerical keys.

NOTE

- If the number has more than one digit, press the keys in rapid succession.

- For more information about titles, see "Checking the contents of DVD-Video discs: Menus".

PARENTAL CONTROL



- If you activate Parental Control, only discs that you have already authorised as suitable for all ages can be played as above.
- To play any other DVD-Video disc, the OSD will ask you to enter your Parental Control PIN code. When this has been done, play starts automatically.
- To activate Parental Control, and to authorize discs, see Activating Parental Control.

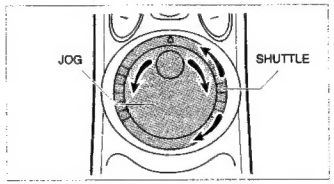
NOTE

- If you forget your PIN code, you can erase it when the code is requested as above, by pressing ■ four times. Parental Control will then be de-activated. To re-activate it, see Activating Parental Control.

JOG/SHUTTLE

This is a convenient way to view still pictures (Jog), and to search in slow, normal or fast motion (Shuttle). Both functions work in reverse as well as forward play.

- To select Jog/Shuttle, press JOG/PAUSE. The key lights up, and the player goes into Pause mode.



Jog

- With the Shuttle ring in the center position, turn the Jog disk clockwise to view still pictures forwards, or anticlockwise to view them in reverse. Turn slowly for step frames, faster to move quickly through a sequence.

Shuttle

- From the center position, turn the Shuttle ring clockwise for forward movement, anticlockwise for reverse. In both cases you can choose from 6 speeds: x1/8, 1/2, Normal, x2, x4 and x32 speed.
- To exit Jog/Shuttle, press JOG/PAUSE: the Jog/Pause key goes out.

STILL PICTURE AND STEP FRAME

- To get a still picture, press ⏸ during play.
- To step forward to the next picture frame, press ⏸ again.
- To return to play, press ▶.

SEARCH

- To search forwards or backwards through the disc at 4x normal speed, press ▶▶ or ◀◀ for about 1 second during play.
  - ➜ Search begins, and sound is muted.
- To step up to 32x normal speed, press ▶▶ or ◀◀ again.
- To go directly to 32x normal speed, hold down ▶▶ or ◀◀ until the ▶▶▶ or ◀◀◀ icon appears.
- To return to 4x normal speed, press ▶▶ or ◀◀ again.
  - ➜ Search speed and direction are indicated on the screen for 2 seconds each time ▶▶ or ◀◀ is pressed.
- To end the search, press ▶, ⏸, or ■ as desired.

SHUFFLE

This shuffles the playing order of chapters within a title, if the title has more than one.

- Press SHUFFLE briefly during play.
  - ➜ SHUFFLE appears on the screen for about 2 seconds.
- As each chapter is played, its number disappears from the track calendar.
- To return to normal play, press SHUFFLE briefly.

REPEAT CHAPTER/TITLE/DISC

- To repeat the currently playing chapter, press REPEAT for about 1 second.
  - ➜ **REPEAT CHAPTER** appears on the player display.
- To repeat the currenty playing title, press REPEAT a second time for about 1 second.
  - ➜ **REPEAT TITLE** appears on the display.
- To repeat the entire disc, press REPEAT a third time for about 1 second.
  - ➜ **REPEAT** appears on the display.
- To exit Repeat mode, press REPEAT a fourth time for about 1 second.

A-B REPEAT

To repeat or loop a sequence in a title:

- Press A-B REPEAT briefly at your chosen starting point.
  - ➜ **A** appears on the player display.
- Press A-B REPEAT briefly again at your chosen end point.
  - ➜ **A-B** appears on the display, and the repeat sequence begins.
- To exit the sequence, press A-B REPEAT briefly again.

CAMERA ANGLE

- If the disc contains sequences recorded from different camera angles, the angle icon appears showing the number of available angles, and the angle being shown. You can then change the camera angle if you wish.
- To get another angle, press ANGLE ◇.
  - ➜ The angle icon will show the next angle.
- To go to any angle directly, enter the angle number using the numerical keys (**0-9**).

NOTE

- The angle icon remains on the screen unless you turn off the

angle feature.

- To turn off the angle feature, press OSD.
  ➜ the angle icon disappears.
- To turn the angle feature on again, press angle again.
  ➜ the angle icon reappears.

CHANGING THE AUDIO LANGUAGE AND CHANNEL CONFIGURATION

This changes the language and the audio channel configuration when alternatives are available on the disc.

- Press AUDIO during play.
  ➜ The audio language and channel configuration icons appear on the screen for 2 seconds.
- Press AUDIO repeatedly to step through the options.
  ➜ At each step, the language changes. If the sound configuration changes too (for example from multichannel to stereo) this is also indicated.

SUBTITLES

- When subtitles are available on a disc, you can turn them on by holding SUBTITLE down during play until the subtitles appear.
- To step through the language options, press SUBTITLE repeatedly.
- To turn the subtitles off, hold SUBTITLE down again.

SCAN

Plays the first 10 seconds of each title on the disc.

- Press SCAN for about 1 second.
- To continue play at your chosen title, press SCAN again for about 1 second or press ▶.

CHECKING THE CONTENTS OF DVD-VIDEO DISCS: MENUS

For titles and chapters, selection menus may be included on the disc. The DVD's Menu feature allows you to make selections from these menus. If the selections are numbered, press the appropriate numerical key; if not, use the Up/Down, Left/Right keys to highlight your selection, and press ENTER

- Press TITLE. If the disc has a Title menu, this now appears on the OSD.
- To remove the Title menu, press TITLE again.
- Press MENU. If the present Title has a Root menu, this now appears on the OSD.
- The Root menu can lists camera angles, spoken language and subtitle options, and Chapters for the Title.
- To remove the Root menu, press MENU again.

PLAYING A VIDEO CD

You will recognize Video CDs by the logo. Depending on the material on the disc (a movie, video clips, a drama series, etc.) it may have one or more tracks, and tracks may have one or more indexes, as indicated on the disc case. To make access easy and convenient, your player lets you move between tracks, and between indexes.

Some Video CDs have Playback Control (PBC), which is a predefined playback sequence stored on the disc.

NOTE

- During play, various icons will appear on the TV screen for about 2 seconds to confirm that a function has been selected. You can get rid of these icons by pressing OSD.

- At any time during play, you can press OSD to call up the Play Banner, which shows you which functions are active, for about 2 seconds. To keep the Play Banner on the screen, hold down OSD for a couple of seconds. To get rid of the Play Banner, press OSD again.

- List of icons:

- ..... Play
- ..... Pause
- ..... Stop
- ..... A-B repeat
- ..... Search forward
- ..... Search backward
- ..... Slow forward
- ..... Repeat disc
- ..... Repeat track
- ..... Shuffle
- ..... Track indication
- ..... Index indication
- ..... Remaining time of title
- ..... Elapsed time
- ..... Total time

PLAYING A DISC

- With Autoplay on, play starts when you close the disc drawer.
- With Autoplay off, press ▶.
- As the disc plays, the display shows the current track, and the elapsed playing time.
- Play will stop at the end of the disc.
- To stop play at any other time, press ■.
- You can resume play from the point at which you stopped. Press Resume twice.
- The resume feature applies, not only to the disc in the player, but also to the last four discs you have played. Simply re-insert the disc, press RESUME if Autoplay is off, and when you see the Resume icon on the screen, press ▶ again.

MOVING TO ANOTHER TRACK

When a disc has more than one track (which you can see from both the OSD and the player display if you press ■), you can move to another track as follows:

- Press T-C, then press ⏭ briefly during play to step forward to the next track.
- Press T-C, then press ⏮ briefly during play to return to the beginning of the current track. Press ⏮ briefly again to step back to the beginning of the previous track.
- To go directly to any track, press T-C, then enter the track number using the numerical keys.

NOTE

- If the number has more than one digit, press the keys in rapid succession.

MOVING TO ANOTHER INDEX

When a track has more than one index (as indicated on the disc case), you can move to another index as follows:

- Press ⏭ briefly during play to step forward to the next index.
- Press ⏮ briefly during play to return to the beginning of the current index. Press ⏮ briefly again to step back to the beginning of the previous index.
- To go directly to any index enter the index number using the numerical keys.

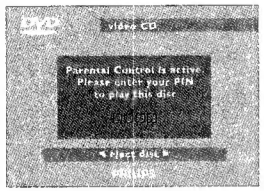
NOTE

- If the number has more than one digit, press the keys in rapid succession.

PLAYBACK CONTROL (PBC)

- Insert a Video CD with PBC and press ▶.
  ➜ The PBC menu appears on the TV screen.
- Go through the menu with the keys indicated on the TV screen until your chosen passage starts to play. If a PBC menu consists of a list of titles, you can select a Title directly.
- Enter your choice with the ⏮, ⏭ or numerical keys.
- Press ▶ to start play of the selected title.
- Press RETURN to go back to the previous menu.

PARENTAL CONTROL



- If you activate Parental Control, only discs that you have already authorised as suitable for all ages can be played as above.
- To play any other Video CD, the OSD will ask you to enter your Parental Control PIN Code. When this has been done, play starts automatically.
- To activate Parental Control, and to authorize discs, see Activating Parental Control.

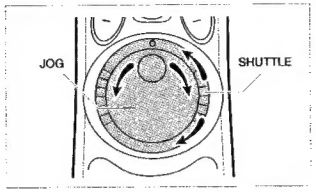
NOTE

- If you forget your PIN code, you can erase it when the code is requested as above, by pressing ■ four times. Parental Control will then be de-activated. To re-activate it, see Activating Parental Control.

JOG/SHUTTLE

This is a convenient way to view still pictures (Jog), and to search in slow, normal or fast motion (Shuttle). Both functions work in reverse as well as forward play.

- To select Jog/Shuttle, press JOG/PAUSE. The key lights up, and the player goes into Pause mode.



Jog

- With the Shuttle ring in the center position, turn the Jog disk clockwise to view still pictures forwards, or anticlockwise to view them in reverse. Turn slowly for step frames, faster to move quickly through a sequence.

Shuttle

- From the center position, turn the Shuttle ring clockwise for forward movement, anticlockwise for reverse. In both cases you can choose from 6 speeds: x1/8, 1/2, Normal, x2, x4 and x32 speed.
- To exit Jog/Shuttle, press JOG/PAUSE: the Jog/Pause key goes out.

STILL PICTURE AND STEP FRAME

- To get a still picture, press ⏸ during play.
- To step forward to the next picture frame, press ⏸ again.
- To return to play, press ▶.

SEARCH

- To search forwards or backwards through the disc at 4x normal speed, press ▶▶ or ◀◀ for about 1 second during play.
  ➜ Search begins, and sound is muted.
- To step up to 32x normal speed, press down ▶▶ or ◀◀ again.
- To go directly to 32x normal speed, hold down ▶▶ or ◀◀ until the ▶▶ or ◀◀ icon appears.
- To return to 4x normal speed, press down ▶▶ or ◀◀ again.
  ➜ Search speed and direction are indicated on the screen for 2 seconds each time ▶▶ or ◀◀ is pressed.
- To end the search, press ▶, ⏸ or ■ as desired.

SHUFFLE

This shuffles the playing order of the tracks, if the disc has more than one.

- Press SHUFFLE briefly during play.
  ➜ SHUFFLE appears on the screen for about 2 seconds.
- As each track is played, its number disappears from the track calendar.
- To return to normal play, press SHUFFLE briefly.

REPEAT TRACK/DISC

- To repeat the currently playing track, press REPEAT for about 1 second.
  ➜ REPEAT TRACK appears on the player display.
- To repeat the entire disc, press REPEAT a second time for about 1 second.
  ➜ REPEAT appears on the display.
- To exit Repeat mode, press REPEAT a third time for about 1 second.

A-B REPEAT

To repeat or loop a sequence:

- Press A-B REPEAT briefly at your chosen starting point.
  ➜ A appears on the player display.
- Press A-B REPEAT briefly again at your chosen end point.
  ➜ A-B appears on the display, and the repeat sequence begins.
- To exit the sequence, press A-B REPEAT briefly again.

SCAN

Plays the first 10 seconds of each title on the disc.

- Press SCAN for about 1 second.
- To continue play at your chosen title, press SCAN again for about 1 second or press ▶.

PLAYING AN AUDIO CD

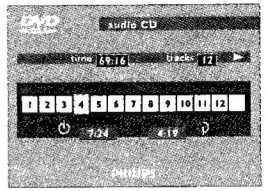
Audio CDs contain music tracks only.
You will recognize CDs by their logo.

COMPACT DISC DIGITAL AUDIO

You can play audio CDs using the OSD or, through a stereo system only, using keys on the remote control and/or front panel.

PLAYING A DISC

- With Autoplay on, play starts when you close the disc drawer.
- With Autoplay off, press ▶.
  ➜ The disc starts to play; if the TV is on, the CD Play screen appears on the OSD.



  ➜ Play will stop at the end of the disc.
- To stop play at any other time, press ■.

PAUSE

- Press ⏸ during play.
- To return to play, press ▶.

SEARCH

- To search forwards or backwards through the disc at 4x normal speed, press ▶▶ or ◀◀ for about 1 second during play.
  ➜ Search begins, and sound is partially muted.
- To step up to 8x normal speed, press ▶▶ or ◀◀ again.
  ➜ Search goes to 8x speed, and the sound is muted.
- To go directly to 8x normal speed, hold down ▶▶ or ◀◀ until the ▶▶ or ◀◀ icon appears.
- To return to 4x normal speed, press ▶▶ or ◀◀ again.
- If the TV is on, search speed and direction are indicated on the screen each time ▶▶ or ◀◀ is pressed.
- To end the search, press ▶, ⏸ or ■ as desired.

MOVING TO ANOTHER TRACK

- Press ⏭ briefly during play to step forward to the next track.
- Press ⏮ briefly during play to return to the beginning of the current track. Press ⏮ briefly again to step back to the beginning of the previous track.
- To go directly to any track, enter the track number using the numerical keys.

NOTE

- If the number has more than one digit, press the keys in rapid succession.

SHUFFLE

- Press SHUFFLE briefly during play.
  ➜ The order of the tracks is changed.
- As each track is played, its number disappears from the player display.
- To return to normal play, press SHUFFLE briefly again.

REPEAT TRACK/DISC

- To repeat the current-playing track, press REPEAT for about 1 second.
  ➜ **REPEAT TRACK** appears on the display.
- To repeat the entire disc, press REPEAT a second time for about 1 second.
  ➜ **REPEAT** appears on the display.
- To exit Repeat mode, press REPEAT a third time for about 1 second.

A-B REPEAT

To repeat or loop a sequence:

- Press A-B REPEAT briefly at your chosen starting point.
  ➜ **A** appears on the player display.
- Press A-B REPEAT briefly again at your chosen end point.
  ➜ **A-B** appears on the display, and the repeat sequence begins.
- To exit the sequence, press A-B REPEAT briefly again.

SCAN

Plays the first 10 seconds of each title on the disc.

- Press SCAN for about 1 second.
- To continue play at your chosen title, press SCAN again for about 1 second or press ▶.

FTS (FAVOURITE TRACK SELECTION)

NOTE

- FTS Favourite Track Selections are compiled and played using the OSD: ensure that the TV is on.

Playing an FTS program

If Auto FTS is set to on, play of the FTS program starts immediately. If Auto FTS is off:

1 Insert a disc and go to Stop mode.

2 Press ≺ or ≻ to start compiling FTS programs.

3 If available the excisting FTS program appears.

4 Follow instructions under "To exclude tracks" or "To select tracks".

To turn Auto FTS on and off, see Settings.

Compiling an FTS program

FTS programs can be compiled by selecting the tracks you want to play ("Track Selection") or by excluding the tracks you don't want to play ("Excluding Tracks").

To exclude Tracks:

1 Insert a disc and go to Stop mode.

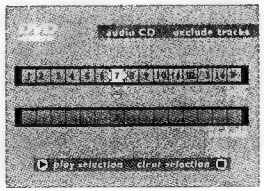
2 Press ≺.

3 Use ≺ or ≻ to move to the first track number you want to exclude.

4 Press ∨.

5 Repeat steps 3 and 4 to exclude further track numbers in the same way. If you change your mind, you can re-include any track number by moving back to it and pressing ∧.

6 To clear your whole selection and start again, press ■.



To select Tracks:

1 Insert a disc and go to Stop mode.

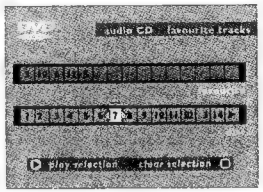
2 Press ▶.

3 Use ≺ or ≻ to move to the first track number you want to select.

4 Press ∧.

5 Repeat steps 3 and 4 to select further track numbers in the same way. If you change your mind, you can de-select track numbers in reverse order by pressing ∨ as required.

6 To clear your whole selection and start again, press ■.



When your FTS program is complete, press ▶ to start play, or RETURN to go back to Stop mode. In either case, the FTS program will be automatically memorized.

NOTE

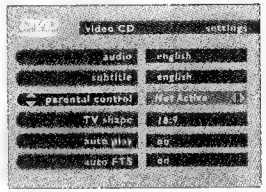
- You can have a total of at least 100 FTS programmed discs. If you exceed that number, the least frequently played FTS program(s) are automatically deleted.

SETTINGS

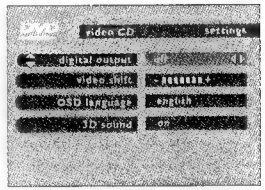
In the settings menu, you can customize your player to suit your own particular requirements.

In Stop mode:

- Press SETUP to obtain the Settings screen.



- Move to the function you want to change using ∨ ∧ then use ≺ ≻ to scroll to your preferred option.



- To exit Settings menu, press RETURN or SETUP.

Audio

The sound will be in the language you choose provided this is available on the disc in play. If not, speech will revert to the first spoken language on the disc.

Subtitle

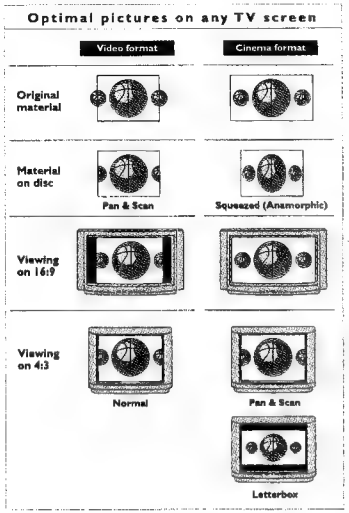
The subtitles will be in the language you choose provided this is available on the disc in play. If not, subtitles will revert to the first subtitle language on the disc.

Parental Control

Parental Control is described separately under 'Parental Control'.

TV Shape

Factory setting 16:9 (wide screen). If you have a regular (4:3) TV, you can choose Letterbox for a 'wide-screen' picture with black bars top and bottom, or Pan Scan, for a full-height picture with the sides trimmed. If a disc has Pan Scan, the picture then moves (scans) horizontally to keep the main action on the screen.



Auto Play

Factory setting ON means that discs starts to play automatically when inserted. Set to OFF if you prefer to start play manually.

Auto FTS

Factory setting ON means that when a disc with an FTS program (see 'Compiling an FTS program) is inserted, the FTS program automatically starts to play. Set to Off if you prefer to control FTS play manually.

Digital Output

Factory setting OFF means that there is no audio signal at the digital output. If you are connecting equipment with a digital input, change the setting to ALL.
If your equipment doesn't include a digital decoder, (e.g. digital speakers) set the digital output to PCM.

Video

Factory setting centers the video on your TV screen. Use this setting to personalize the position of the picture on your TV by scrolling it to the left or right.

OSD Language

The player's on-screen display will be in the language you choose.

3D Sound

To enjoy multichannel sound even on two speakers, turn 3D Sound on.

TruSurround™ with SRS

PARENTAL CONTROL

ACTIVATING PARENTAL CONTROL

This can only be done in Stop mode.

1 Press SETUP to obtain the Settings menu.

2 Move to Parental Control using ▼ ▲.

3 Press ◀ or ▶ to change Parental Control to Active.

4 You will be asked to enter a 4-digit pin code of your own choice, and then to confirm your choice.

5 This code must then be entered to play any DVD-Video or Video CD disc, unless you have previously authorized the disc as suitable for all ages.

6 To de-activate Parental Control repeat the above procedure.

AUTHORIZING DISCS

1 Insert the disc you wish to authorize and close the tray.
➜ The OSD will ask for your pin code.

2 Enter your pin code.

3 Press ■.

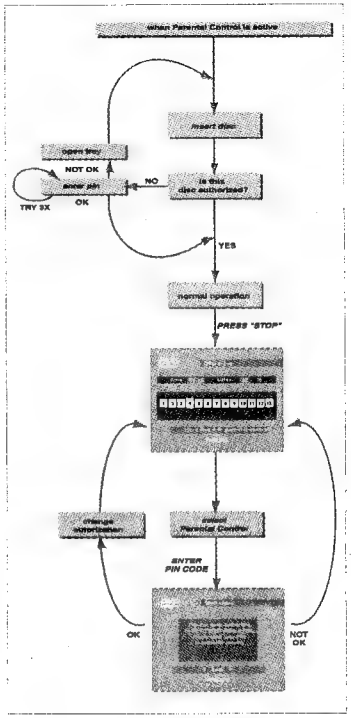
4 Select Parental Control on the OSD by pressing ▶.
➜ The OSD will ask for your pin code.

5 The disc is now authorized, and will play in the normal way, without the pin code.

To cancel your authorization, repeat steps 4 and 5.

NOTE

- You can have a total of 50 authorized discs. If you exceed that number, the least frequently played disc(s) are automatically de-authorized.



BEFORE REQUESTING SERVICE

If it appears that the DVD-Video player is faulty, first consult this checklist. It may be that something simple has been overlooked. Under no circumstances attempt to repair the system yourself; this will invalidate the warranty.

Look for the specific symptom(s). Then perform only the actions listed to remedy the specific symptom(s).

SYMPTOM
- Remedy

NO POWER
- Check if the on/off button on the rear of the player is set to on.
- Check if both plugs of the mains cord are properly connected.
- Check if there is power at the AC outlet by plugging in another appliance.

NO PICTURE
- Check if the TV is switched on.
- Select the same channel and source on the TV as on the player.
- Check the video connection.

DISTORTED PICTURE
- Check the disc for fingerprints and clean with a soft cloth, wiping from centre to edge.
- Sometimes a small amount of picture distortion may appear.This is not a malfunction.

DISC CAN'T BE PLAYED
- Ensure the disc label is upwards.
- Clean the disc.
- Check if the disc is defective by trying another disc.

NO SOUND
- Check audio connections.
- If using a HiFi amplifier, try another sound source.

DISTORTED SOUND FROM HIFI AMPLIFIER
- Check that the player's audio L/R output is not connected to the amplifier's phono input.

NO RETURN TO START-UP SCREEN WHEN DISC IS REMOVED
- Reset by switching the player off, then on again.
- Check to see if the program requires another disc to be loaded.

THE PLAYER DOES NOT RESPOND TO THE REMOTE CONTROL
- Aim the remote control directly at the sensor on the front of the player.
- Avoid all obstacles which may interfere with the signal path.
- Inspect or replace the batteries.

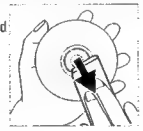
DISTORTED OR BLACK AND WHITE PICTURE WITH DVD OR VIDEO CD DISC
- The disc format is not according to the TV-set used (NTSC/PAL).

NO AUDIO AT DIGITAL OUTPUT
- Check the digital connections.
- Check the settings menu to make sure that the digital output is set to on.
- Check if the audio format of the selected audio language matches your receiver capabilities.

BUTTONS DO NOT WORK
- Reset by switching the player off, then on again.

CLEANING DISCS

Some problems occur because the disc inside the player is dirty. To avoid such problems clean your discs regularly with a soft cloth. Wipe the disc from the center out.



CAUTION

Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for analog discs.

DIAGNOSTIC PROGRAM

If the fault persists, you can run the Diagnostic Program in the player.

INSTRUCTIONS:

1 Switch the player off.

2 Hold both OPEN/CLOSE and ▮▮ pressed and switch on the player.

➜ 'BUSY' appears on the display together with a counter. The counter indicates the termination of the test when it reaches zero.

➜ After a few minutes, 'BUSY' changes to 'ERROR' or 'PASS'.

3 Swith off the player to exit the Diagnostic Program.

4 'ERROR' indicates that your player needs repair. Contact your dealer or the Philips Customer Care Center (PCCC).

5 'PASS' indicates that the Diagnostic Program has found no fault. In this case, the malfunction may be due to misinterpretation of the operating intructions, or an unsuitable disc, or incorrect connections. If you still cannot solve the problem, contact your dealer or the Philips PCCC.

6 You will find the phone number of the Philips PCCC in your Warranty Booklet.

4. Service hints

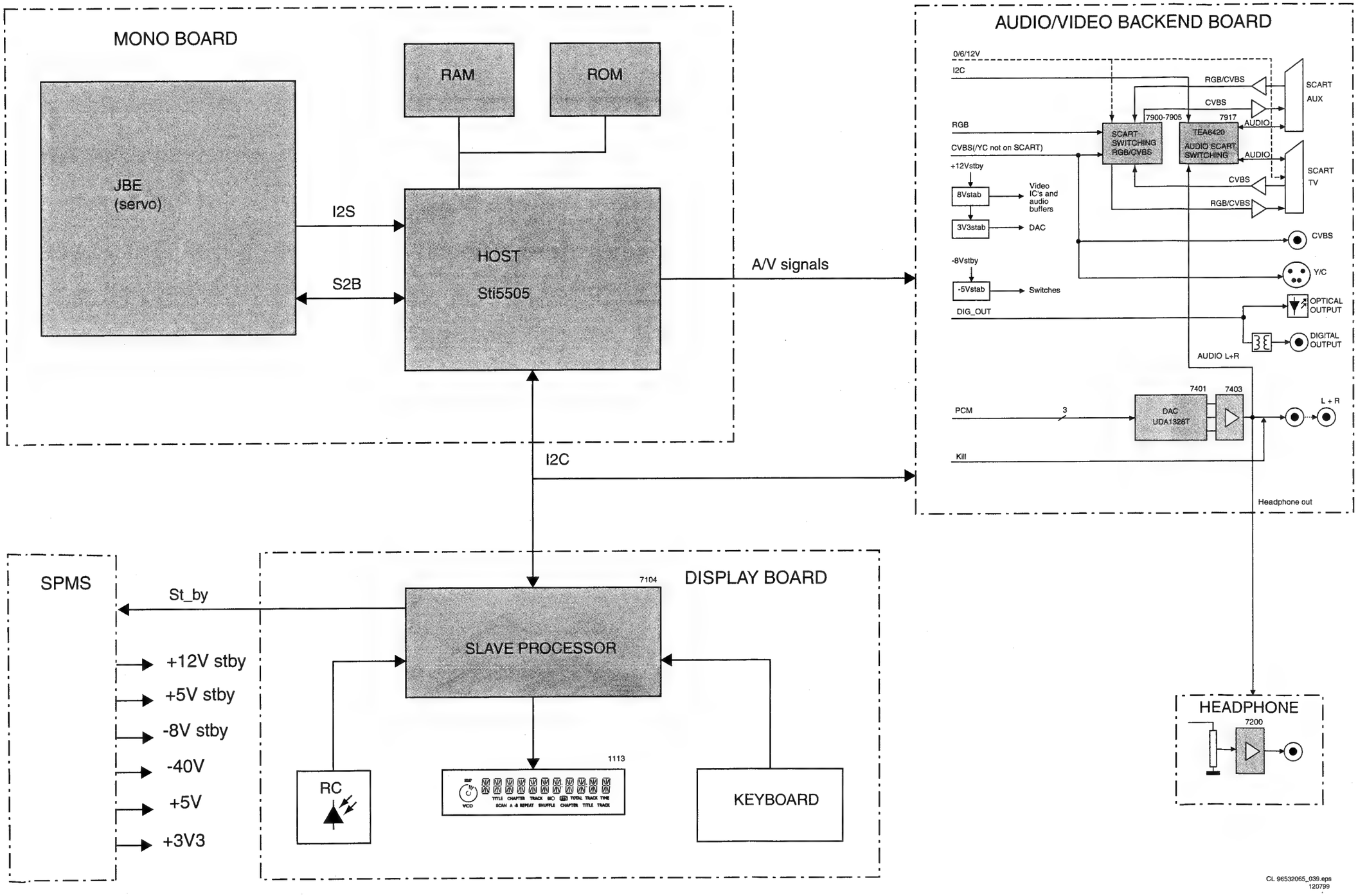
The DVD module(Basic Engine and the mono board) has to be exchanged completely in case of failure. A new module for DVD960/001 can be ordered with codenumber 3104 129 51980.
Return the defective unit complete assembled in original package to Philips Consumer Service in Eindhoven

The new loader has to be upgraded with the "Firmware" version V9.30.
Upgrading has to be done with a CDROM upgrade disc.

In case a failure should be found on the A/V PCB or the Display PCB the complete PCB has to be replaced.

5. Block and wiringdiagram, dismantling, exploded view and oscillograms

Blockdiagram



Dismantling instructions

DISMANTLING INSTRUCTIONS

See exploded view for item numbers

Cover 151
⇒ Remove 7 screws 174→177 at sides 171→173 at rearside
⇒ Lift cover at rearside to remove

mounting ↑↓ demounting

Front assy 1
⇒ remove 2 screws 75→ 76 (front 1 →frame 181)
⇒ unlock front from frame by releasing successively 3 snaps(on the left, in the middle and on the right)
⇒ put front assy in front of the set(service position)

Display board 1002
⇒ Remove 7 screws 27 → 33(board→ front), pay attention to earth spring 24.
⇒ demount board

Headphone board 1003
⇒ Remove volume knob by pulling it forward
⇒ remove 2 screws 34→35(board →front)
⇒ demount board

Standby board 1003
⇒ Remove 2 screws 25 → 26(board→ front)
⇒ demount board

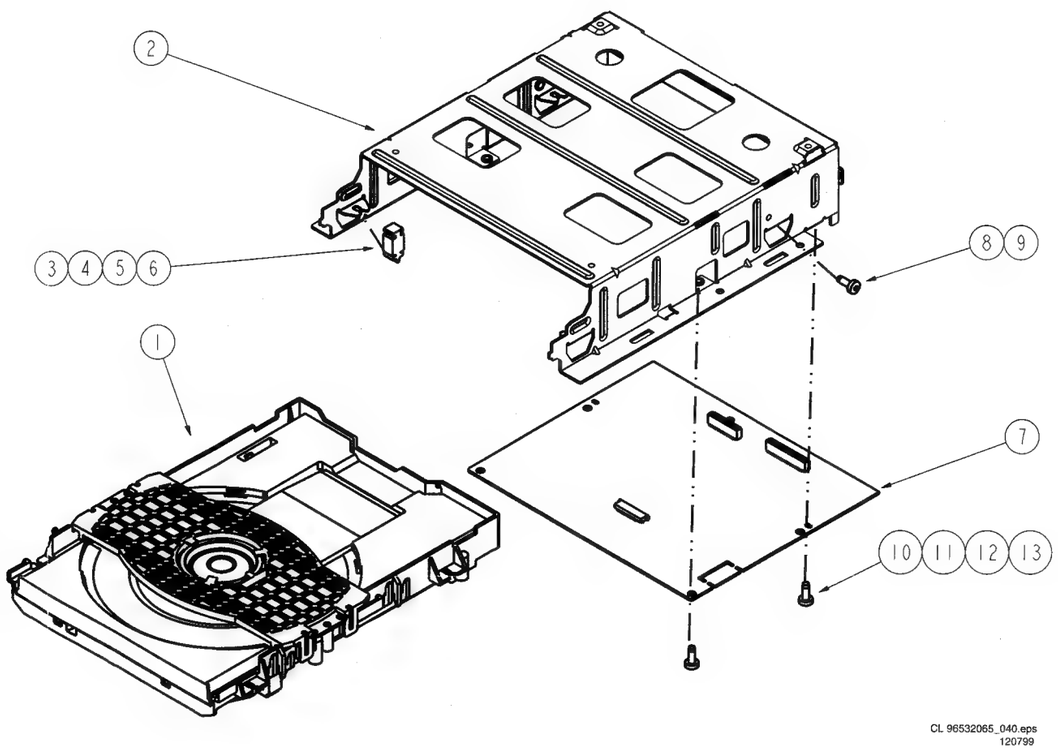
DVD MODULE 82
⇒ Remove connections to Mono board
⇒ remove 4 screws 200→ 203(loader bracket 2 → frame 181)
⇒ demount module

DVD MONO Board 7
⇒ See also exploded view of DVD module
⇒ Remove flex connections to turntabel motor and sledge motor.
⇒ remove 4 screws 10 → 13(mono board 7 → loader bracket 2)
⇒ remove carefully flex connection to OPU and wire connection to tray motor.
⇒ demount board.

LOADER VAL3000 1
⇒ Remove 2 screws 8, 9
⇒ Remove 4 suspensions 3 → 6 from loader bracket

A/V board 1001
⇒ remove flex connections to Mono board
⇒ remove 1 screw 268 (scart→backplate 266)
⇒ remove 2 screws 271 and 274 (cinches→backplate)
⇒ remove 2 screws 272 and 273 (digital and optical out)
⇒ release snaps of 2 spacers 208 and 209 (board → frame)
⇒ demount board

Power supply unit 1005
⇒ remove connections
⇒ remove 2 screws 204 and 215 (board→frame)
⇒ remove screw 276 (mains inled→backplate)
⇒ release snaps of spacers 206 and 207 (board→frame)
⇒ demount board



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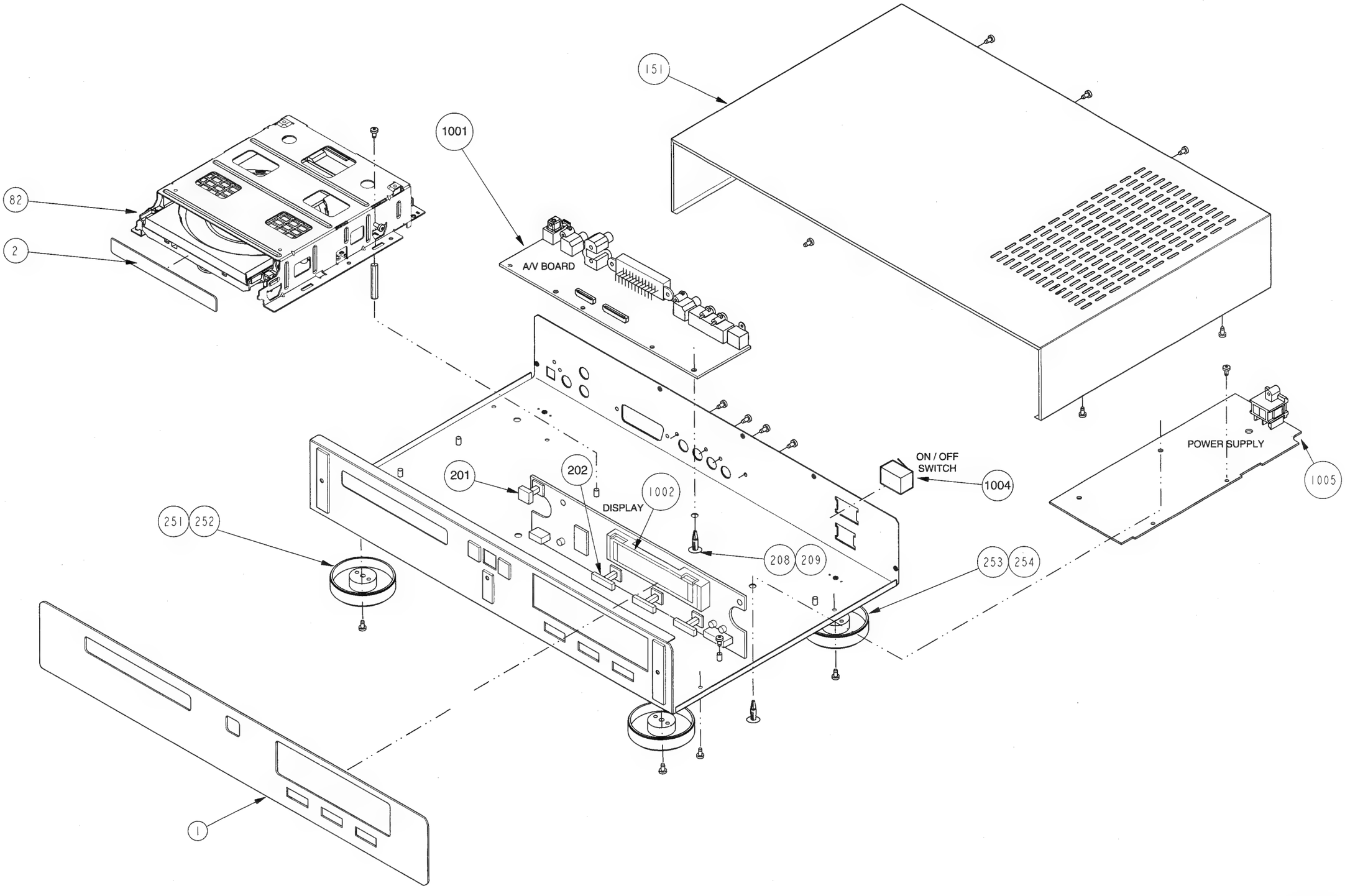
Exploded view



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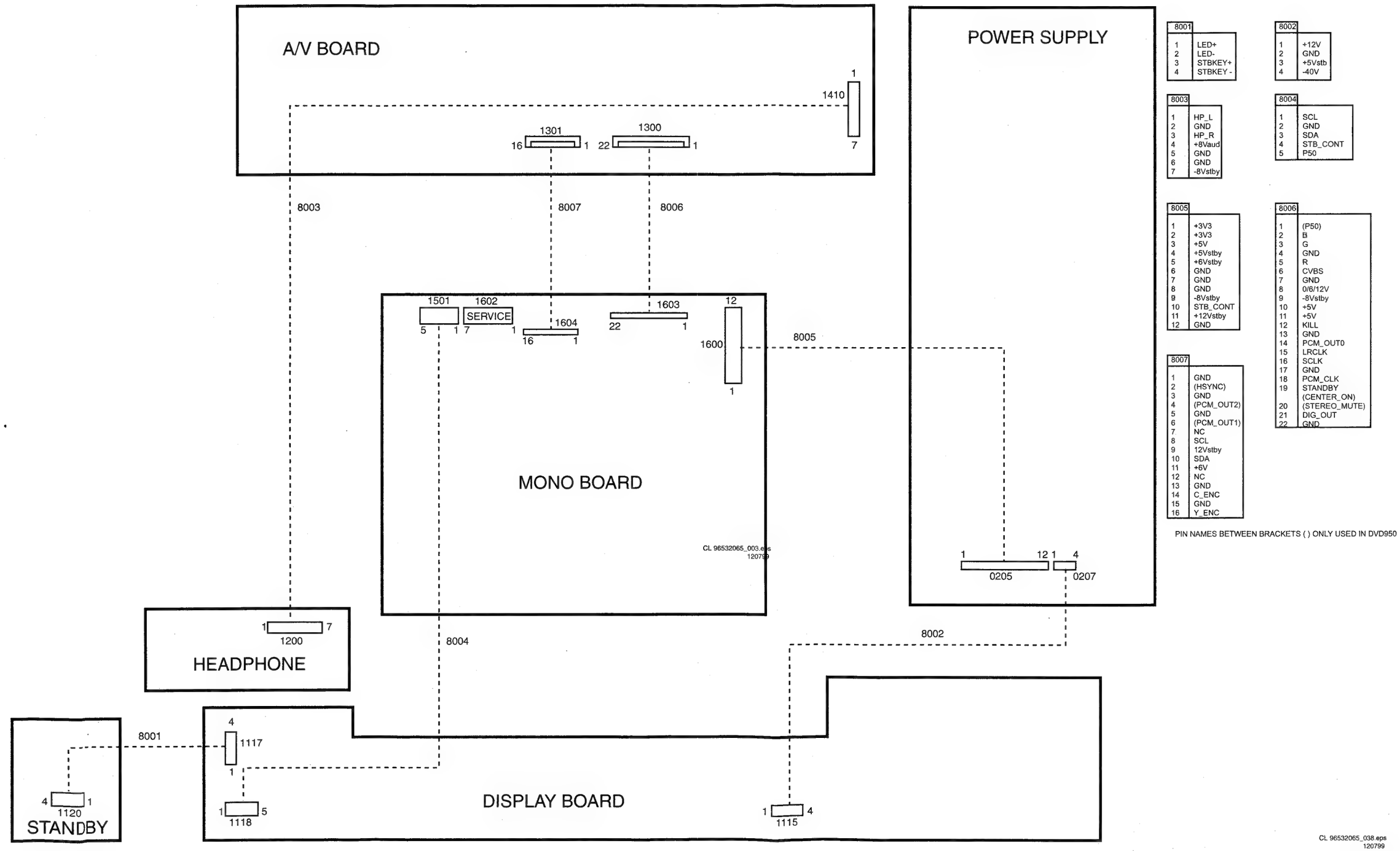
Wiringdiagram

WIRING DIAGRAM



8001	
1	LED+
2	LED-
3	STBKEY+
4	STBKEY -

8002	
1	+12V
2	GND
3	+5Vstb
4	-40V

8003	
1	HP_L
2	GND
3	HP_R
4	+8Vaud
5	GND
6	GND
7	-8Vstby

8004	
1	SCL
2	GND
3	SDA
4	STB_CONT
5	P50

8005	
1	+3V3
2	+3V3
3	+5V
4	+5Vstby
5	+6Vstby
6	GND
7	GND
8	GND
9	-8Vstby
10	STB_CONT
11	+12Vstby
12	GND

8006	
1	(P50)
2	B
3	G
4	GND
5	R
6	CVBS
7	GND
8	0/6/12V
9	-8Vstby
10	+5V
11	+5V
12	KILL
13	GND
14	PCM_OUT0
15	LRCLK
16	SCLK
17	GND
18	PCM_CLK
19	STANDBY (CENTER_ON)
20	(STEREO_MUTE)
21	DIG_OUT
22	GND

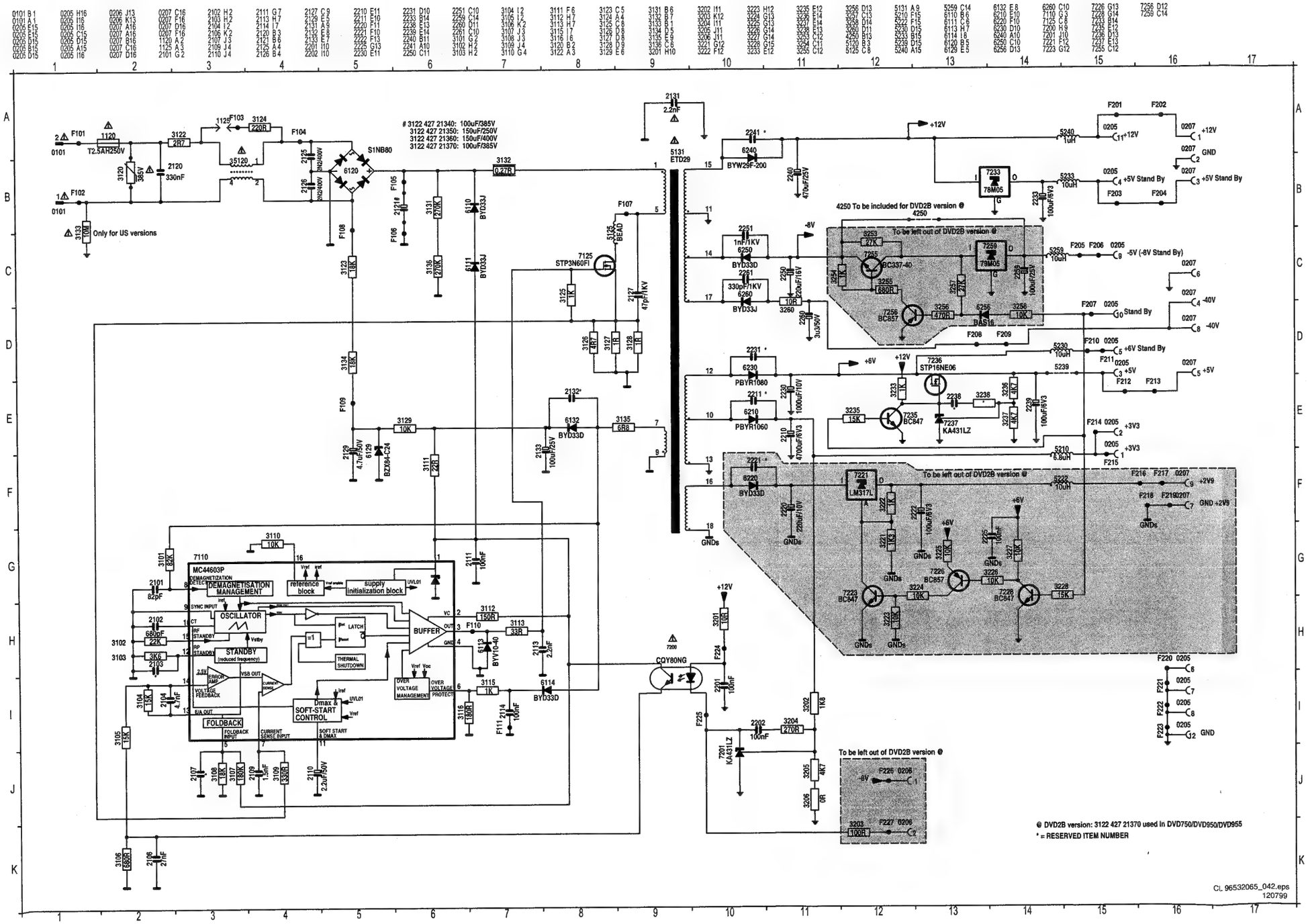
8007	
1	GND
2	(HSYNC)
3	GND
4	(PCM_OUT2)
5	GND
6	(PCM_OUT1)
7	NC
8	SCL
9	12Vstby
10	SDA
11	+6V
12	NC
13	GND
14	C_ENC
15	GND
16	Y_ENC

PIN NAMES BETWEEN BRACKETS ( ) ONLY USED IN DVD950

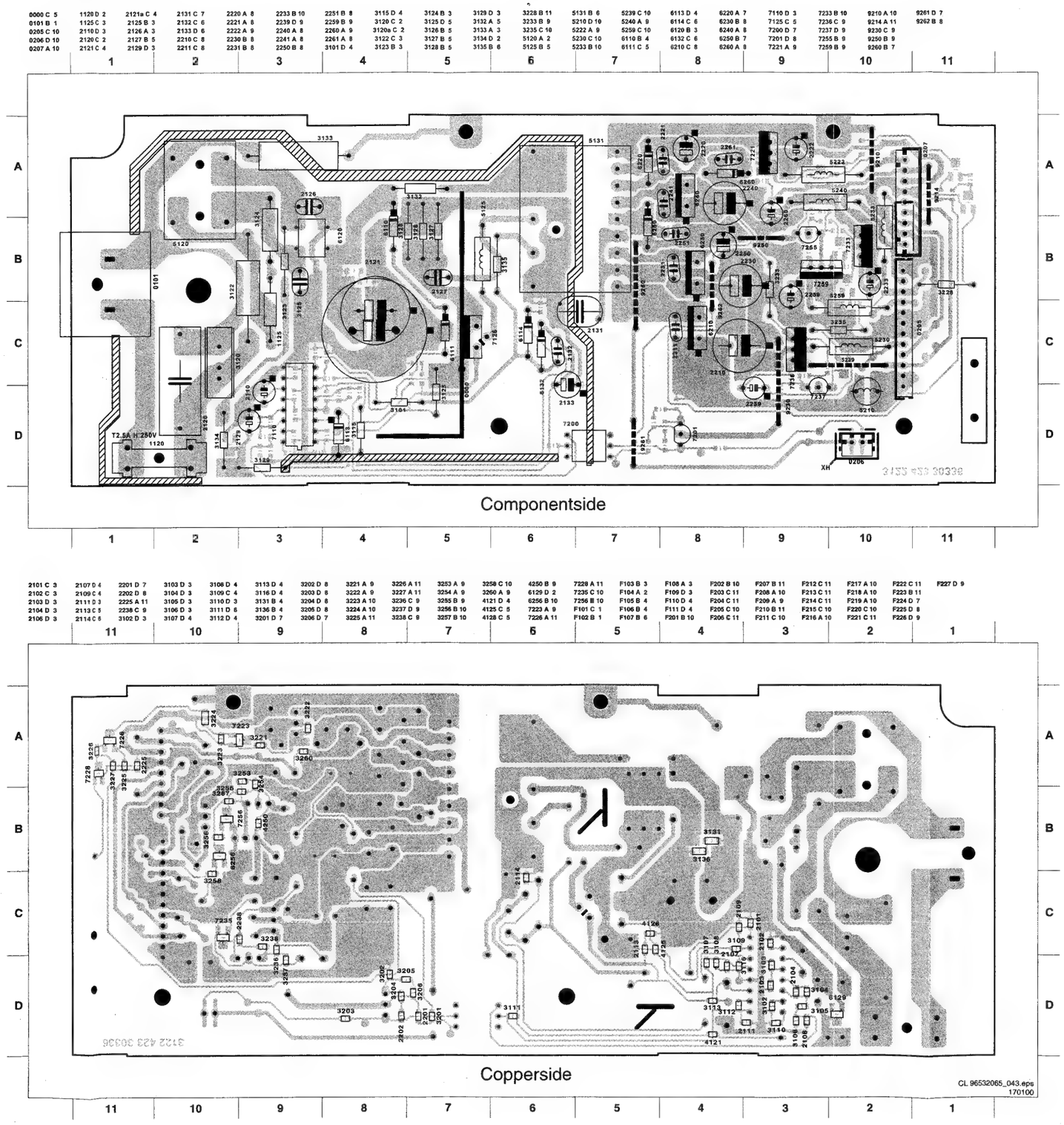
6. Electrical diagrams and Print-layouts

Power supply

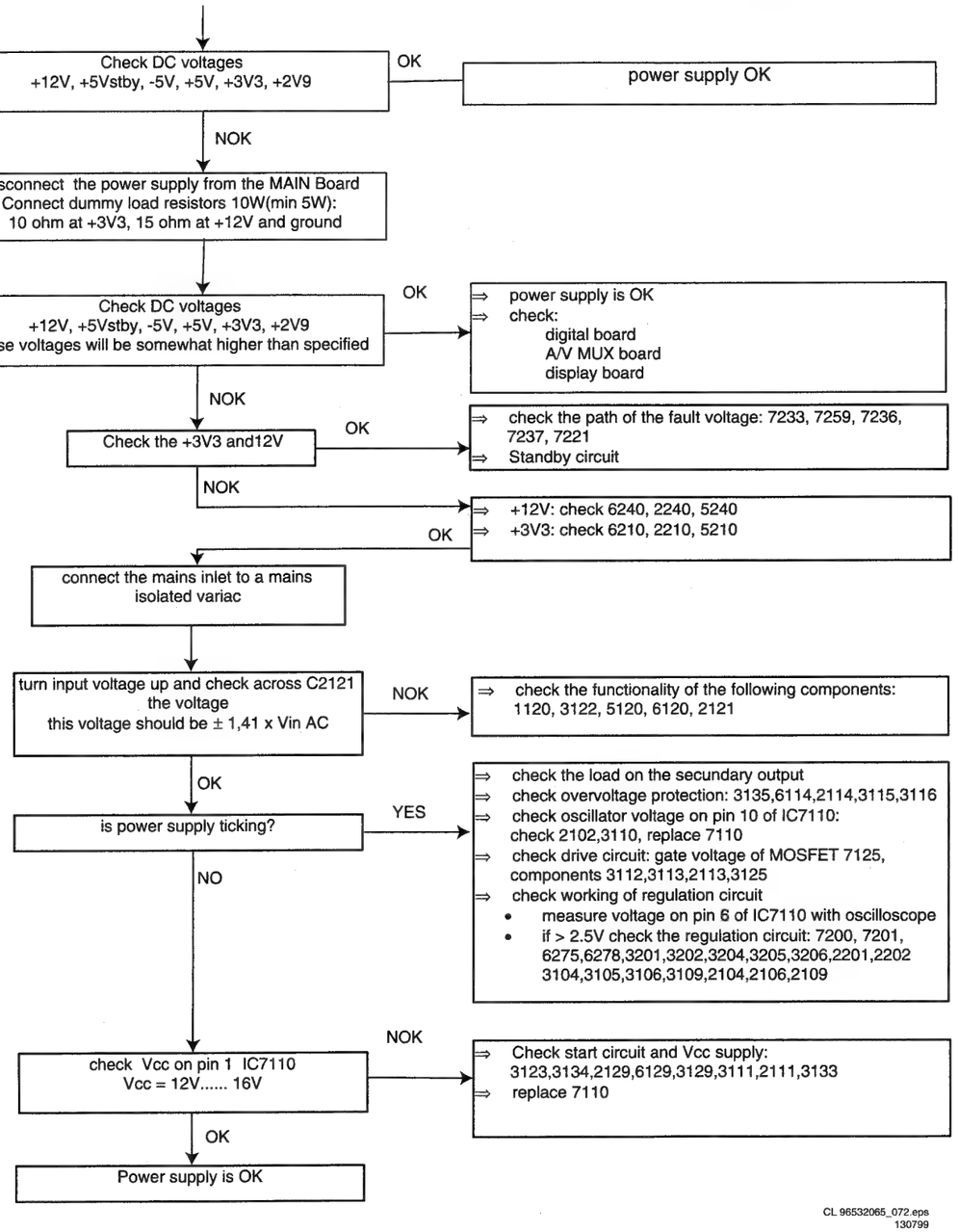
POWER SUPPLY 20PS203



Power supply



TROUBLESHOOTING POWER SUPPLY UNIT 20PS203



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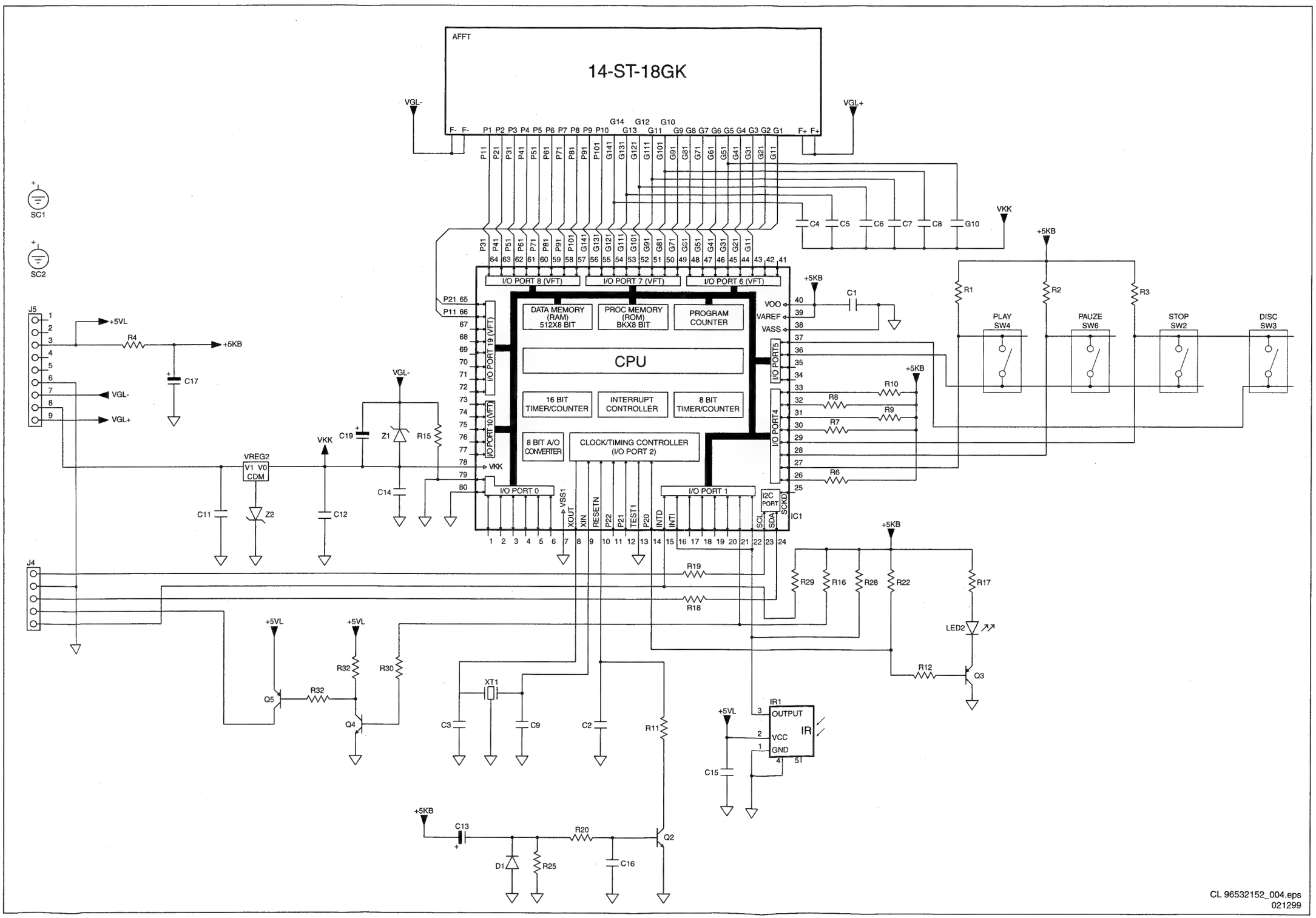
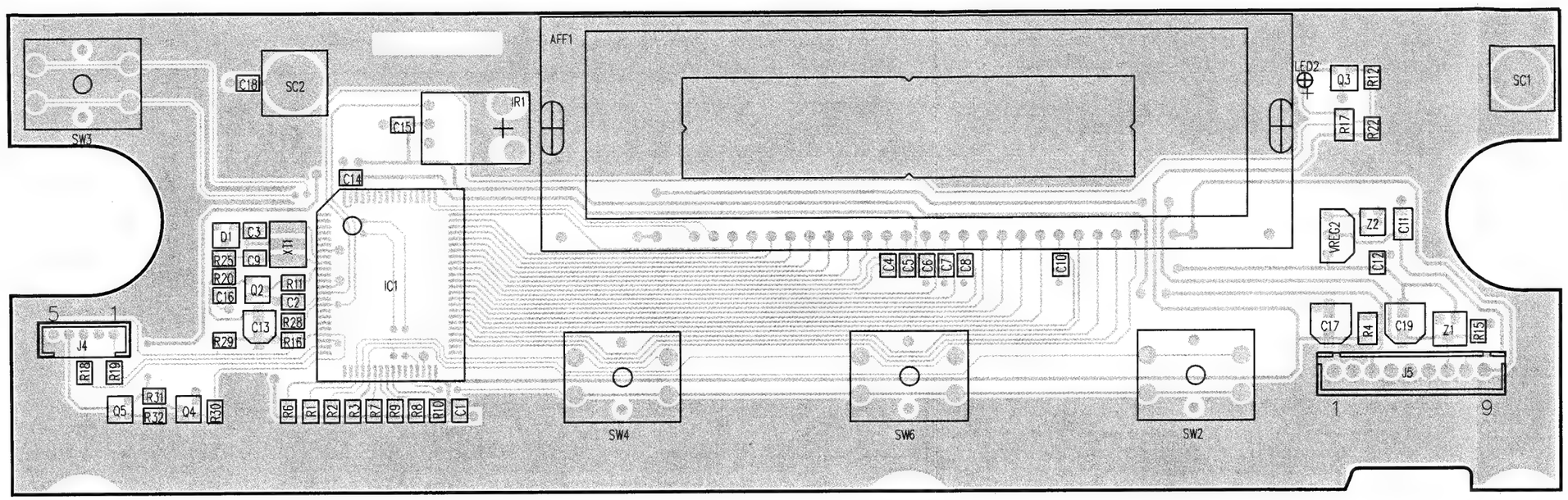
Personal notes:

Display panel



Display panel (component side)



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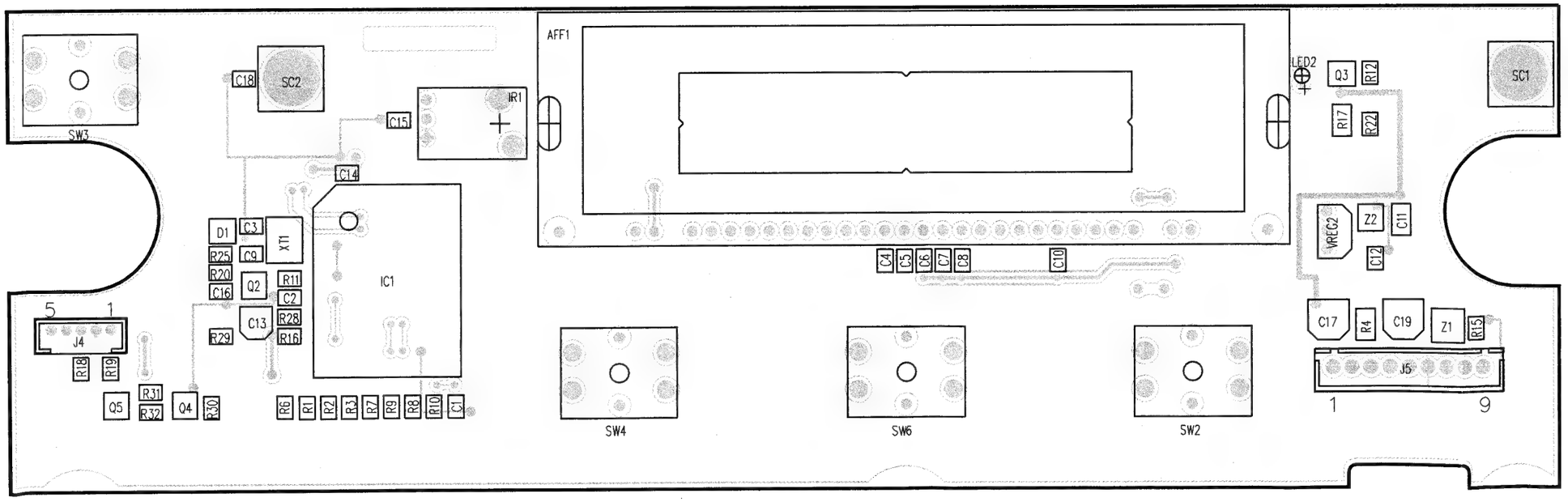
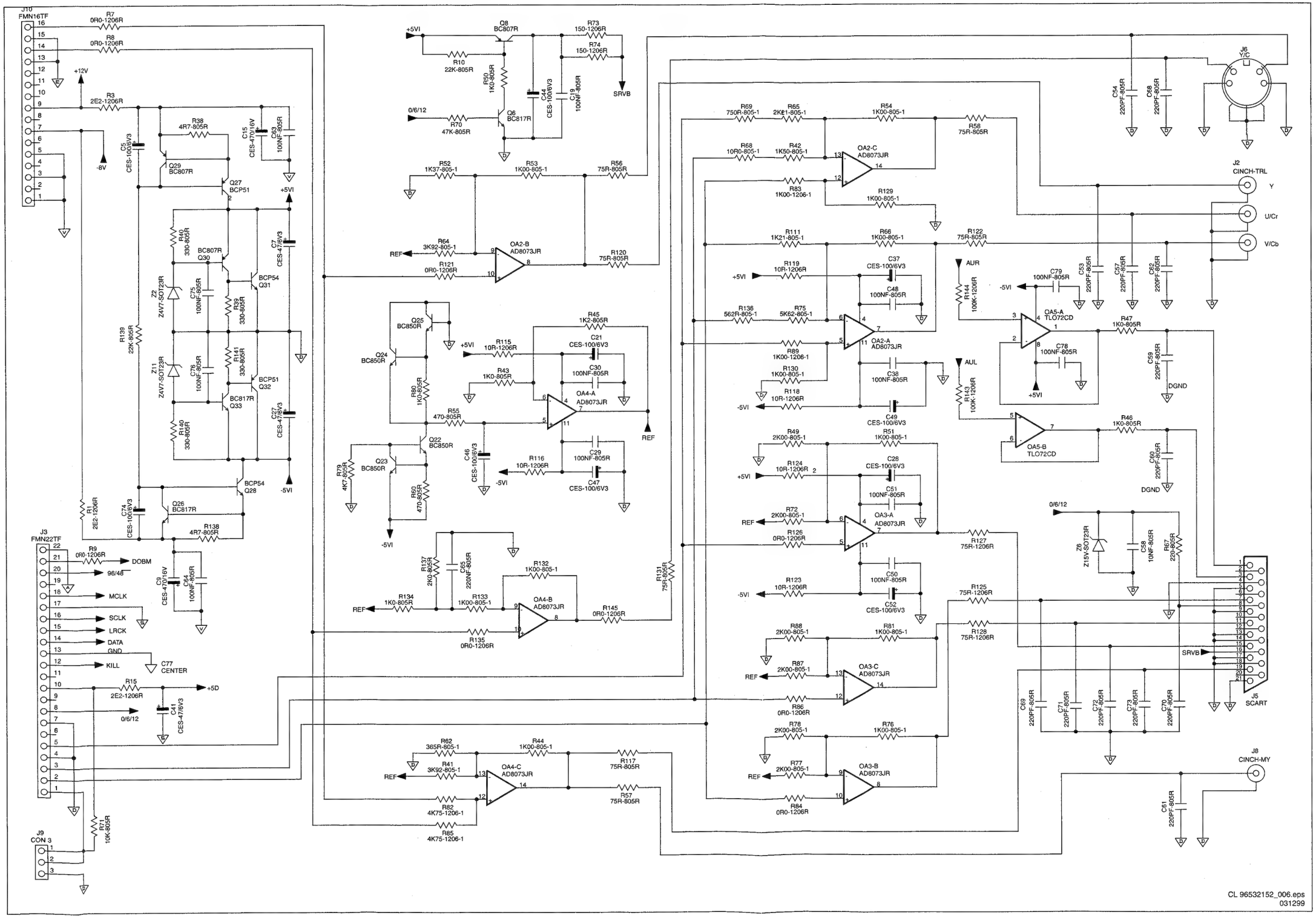
301199

Display panel (solder side)



CL 96532152_003.eps
301199

A/V panel (Part 1)



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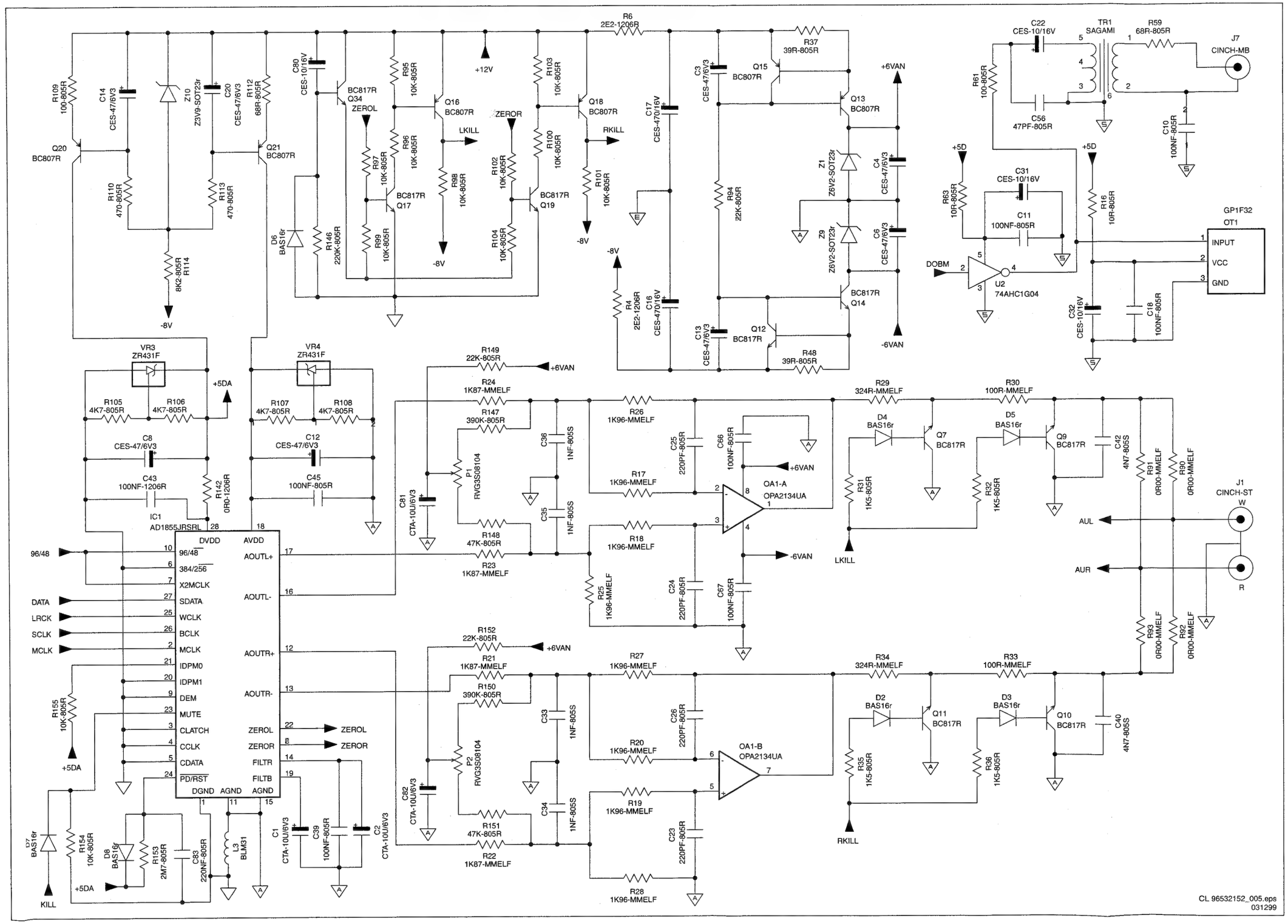
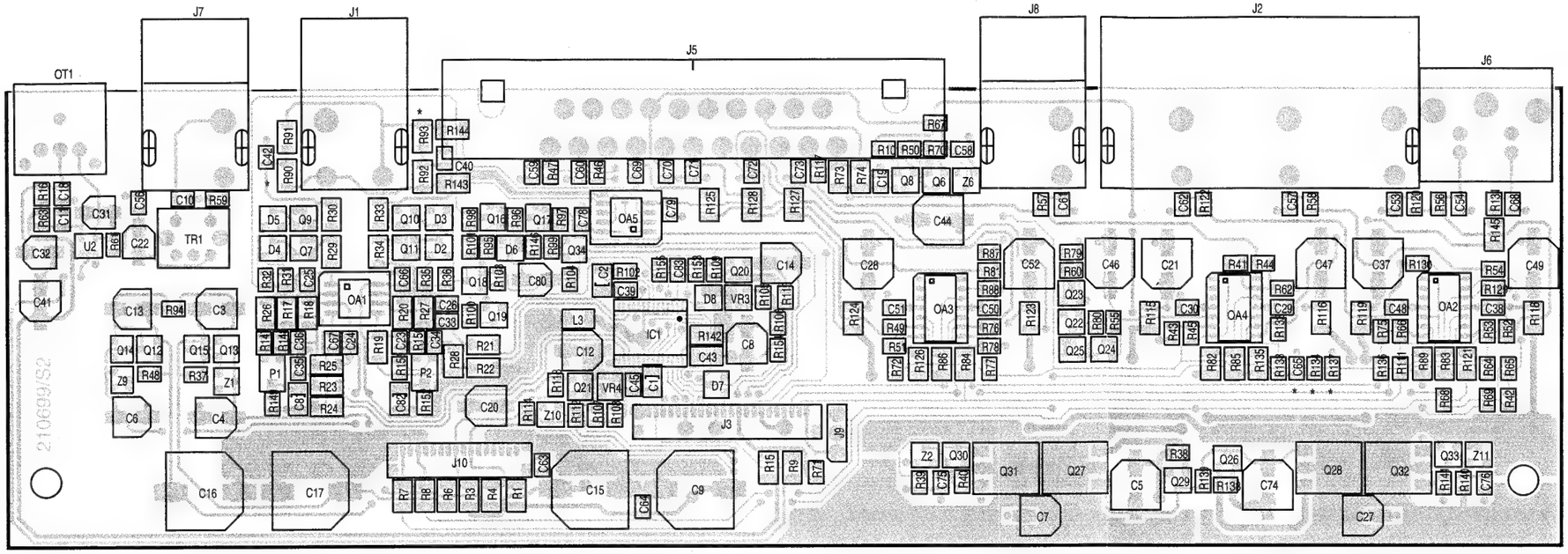
A/V Panel (Part 2)



A/V panel (component side)



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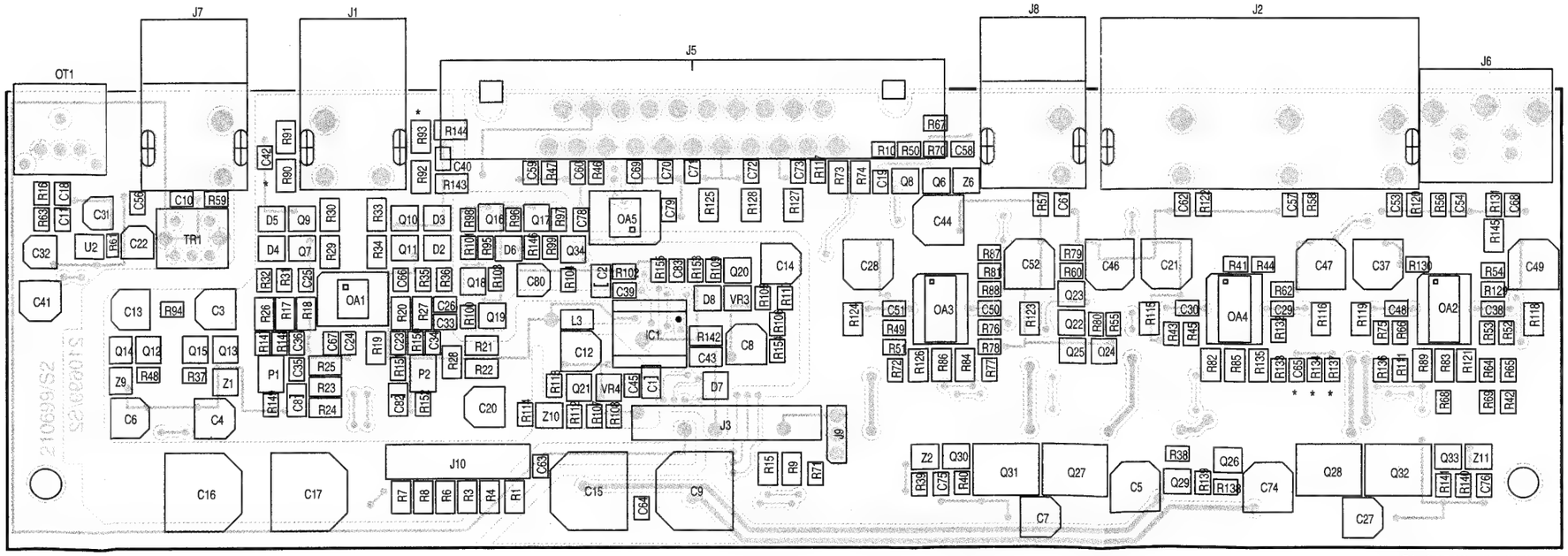
031299

A/V panel (solder side)



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7. DIAGNOSTIC SOFTWARE : SCRIPT INTERFACES

7.1 DEALER SCRIPT

7.1.1 Purpose of Dealer Script

The dealer script can give a diagnosis on a standalone DVD player; no other equipment is needed to perform a number of hardware tests to check if the DVD player is faulty. The diagnosis is simply a "error" or "pass" message; no indication is given of faulty hardware modules. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

7.1.2 Contents of Dealer Script

The dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD player.
The nuclei called in the dealer script are the following (the number after each nucleus name corresponds with the number being on the local display when the nucleus is executed during the dealer script):

Nucleus		Description
VideoColSetupComm	9	Checks the I2C interface with the RGB video processor on the Audio/Video board (only for DVD players with RGB video processor).
VideoScartSwComm	8	Checks the I2C interface with the scart switch on the Audio/Video board
PapChksFl	7	Calculate and verify checksum of FLASH memory.
PapDramWrR	6	Pattern test of all locations in the DRAM(s).
PapI2cDisp	5	Checks the I2C interface with the slave processor on the display PCB.
PapS2bEcho	4	Checks the I2C interface to the basic engine.
PapI2cNvram	3	Checks the I2C interface with the NVRAM.
PapNvramWrR	2	Pattern test of all locations in the NVRAM
CompSdramWrR	1	Pattern test of all locations in the SDRAM(s).

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Figure 7-1

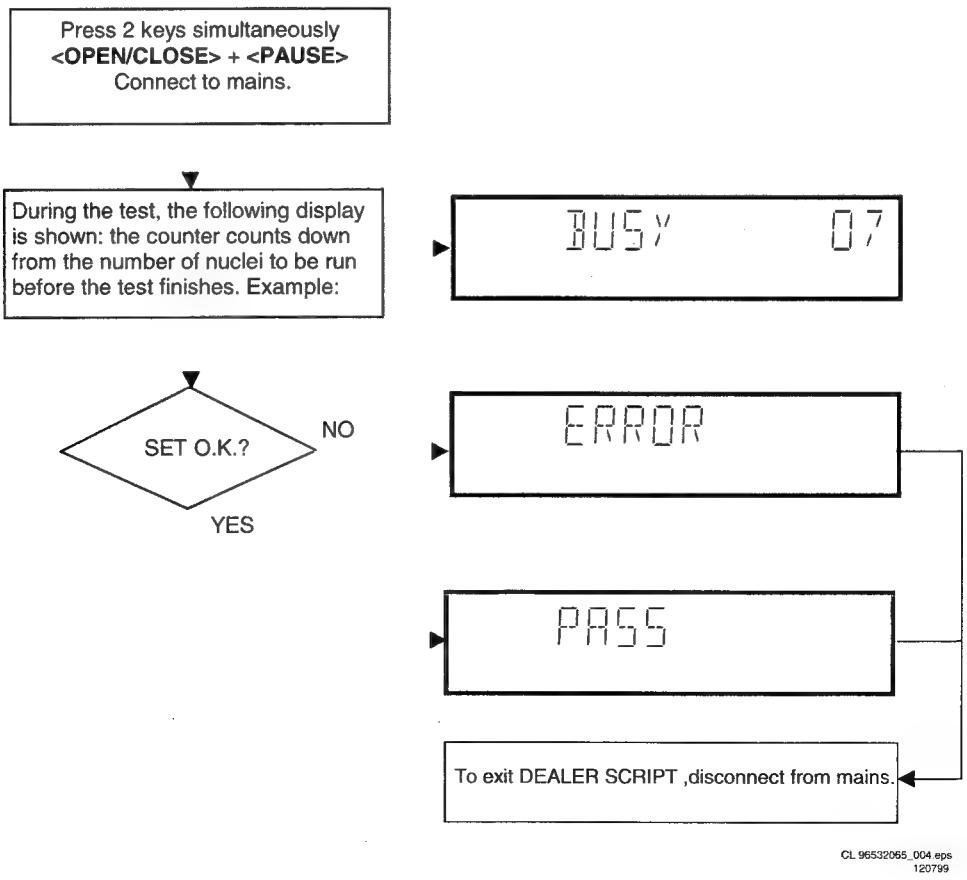

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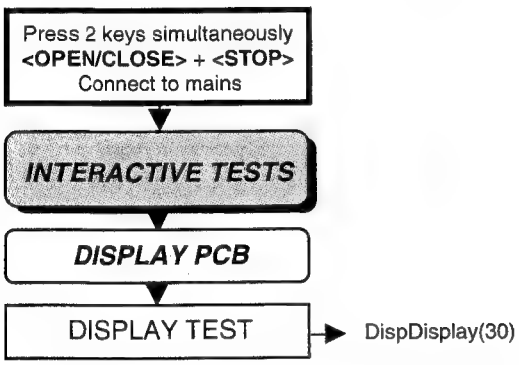
Figure 7-2

8. Display test

8.1 Display test

The display test is performed by nucleus DispDisplay. By putting a series of test patterns on the local display, the local display is tested. To step through all different patterns, the user must either press PLAY (pattern is ok) or PAUSE (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner.

ACTIVATION OF DISPLAY TEST



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170100

Figure 8-1

9. Servicing DVD module

9.1 Introduction

The DVD module(Basic Engine and the mono board) has to be exchanged completely in case of failure. A new module for DVD750/001 can be ordered with codenumber 3104 129 51980.

Return the defective unit complete assembled in original package to Philips Consumer Service in Eindhoven

9.1.1 Reprogramming of new mono boards.

Caution

This information is confidential and may not be distributed. Only a qualified service person should reprogram the mono board.

After replacement of the mono board, all the customer settings and also the region code will be lost. Reprogramming of the mono board will put the player back in the state in which it has left the factory, i.e. with the default settings and the allowed region code.

Reprogramming is limited to 25 times
When the counter reaches 25, reprogramming is not possible anymore
Reprogramming will be done by way of the remote control.
Put the player in stop mode, no disc loaded.
Press the following keys on the remote control:
<***PLAY***> followed by numerical keys ***<1> 5> <9>***
The display shows: "- - - - - - - - - -"
Press now successively the following keys :

for DVD960/001 : ***<0><0><2> <0><0><0><0><0><0><0><0><0>***

Press <***PLAY***> again.
The TV screen will become BLUE during a short time to confirm that the mono board has been reprogrammed, then the set goes to standby mode.

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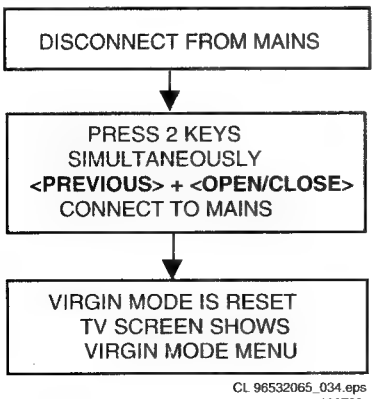
050100

Figure 9-1

9.1.2 Reset of Virgin Mode

After the player has been powered up for test by the dealer, it would have gone through the Virgin Mode. It is possible to reset the settings made during that mode before the delivery of player to the customer. This can be done as shown in the following diagram:



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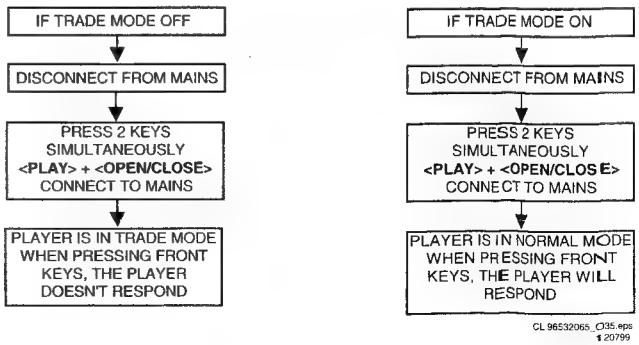
120799

Figure 9-2

TRADE MODE

When the player is in Trade Mode, the player cannot be controlled by means of the front key buttons, but only by means of the remote control.



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120799

Figure 9-3

10. Current mode power supply 20PS203

10.1 Blockdiagram

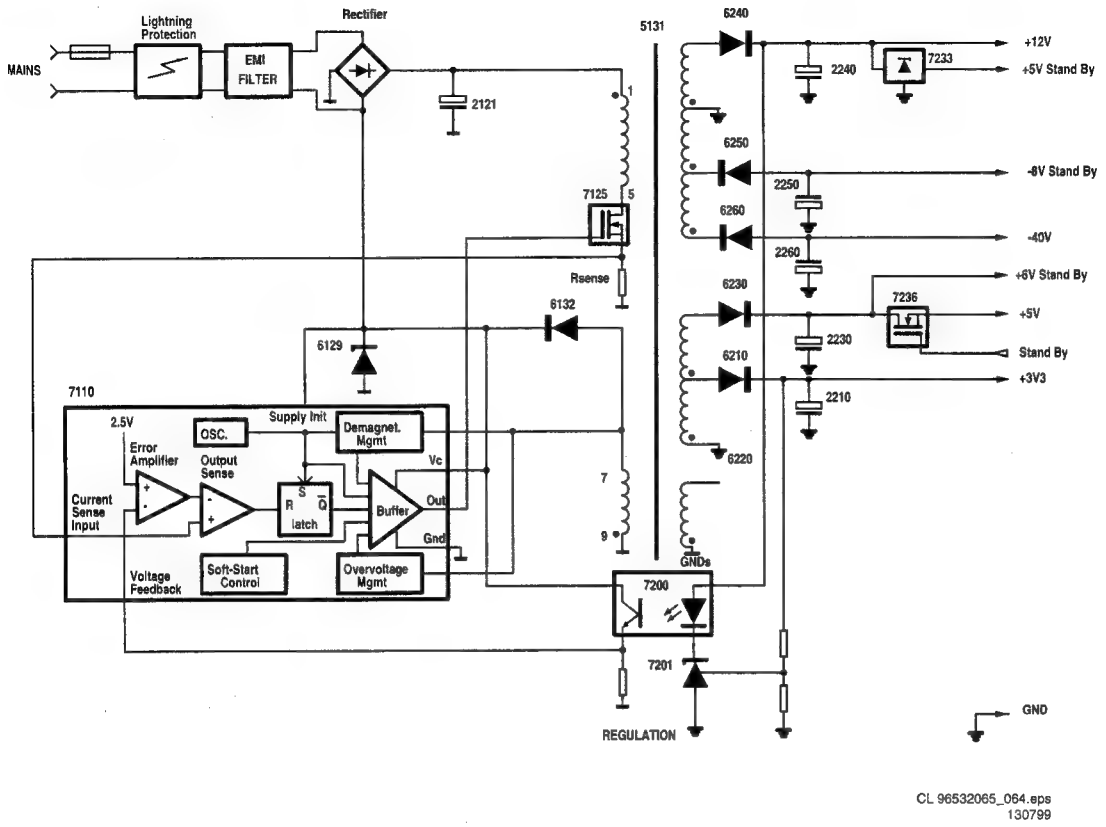

Figure 10-1

10.1.1 Function description of the current mode power supply

MOSFET 7125 is used as a power switch controlled by the controller IC 7110. When the switch is closed, energy is transferred from the mains into the transformer. This energy is then supplied to the load when the switch is opened. By control of the switched-on time, the energy transferred in each cycle is regulated so that the output voltages are independent of load or input voltage variations. The controlling device MC44603P is an integrated pulse width modulator. A clock signal initiates power pulses at a fixed frequency. The termination of each output pulse occurs when an analogue of the inductor current reaches a threshold established by the error signal. In this way the error signal actually controls the peak inductor current on cycle-by-cycle basis.

10.2 General description of MC44603

The MC44603 is an enhanced high performance controller that is specifically designed for Off-line and dc-to dc converter applications. This device has the unique ability of automatically changing operating modes if the converter output is overloaded., unloaded, or shorted. The MC44603 has several distinguishing features when compared to conventional SMPS controllers. These features consist of a foldback facility for overload protection, a standby mode when the converter output is slightly loaded, a demagnetisation detection for reduced switching stresses on transistor and diodes, and a high current totem pole output ideally suited for driving a power MOSFET. It can also be used for driving a bipolar transistor in low power converters. It is optimised to operate in discontinuous mode but can also operate in continuous mode. Its advanced design allows use in current mode or voltage mode control applications.

10.3 Pin connections

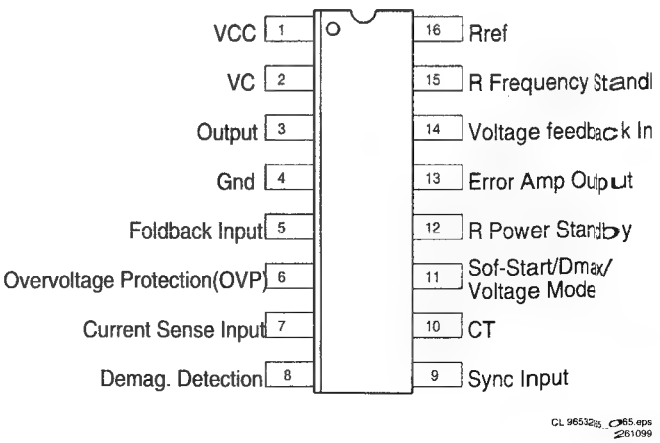

Figure 10-2

10.4 Blockdiagram of MC44603

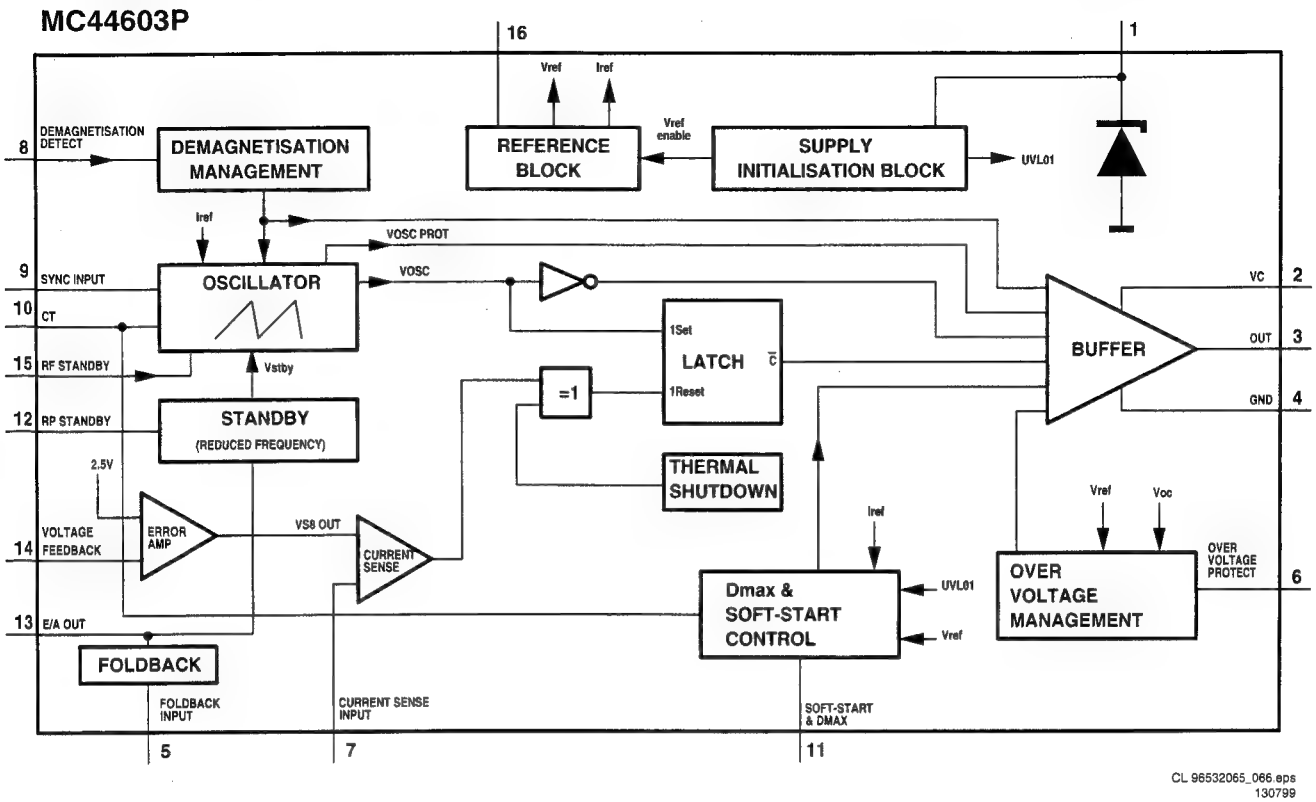

Figure 10-3

10.5 Pin function description

Pin function description

Pin	Name	Description
1	VCC	This pin is the positive supply of the IC. The operating voltage range after start-up is 9.0 to 14.5 V.
2	VC	The output high state (VOH) is set by the voltage applied to this pin.
3	Output	Peak currents up to 750 mA can be sourced or sunk, suitable for driving either MOSFET or Bipolar transistors.
4	Gnd	The groundpin is a single return, typically connected back to the power source.
5	Foldback Input	The foldback function provides overload protection.
6	Overvoltage Protection	When the overvoltage protection pin receives a voltage greater than 2.5V, the device is disabled and requires a complete restart sequence.
7	Current Sense Input	A voltage proportional to the current flowing into the power switch is connected to this input.
8	Demagnetisation Detection	A voltage delivered by an auxiliary transformer winding provides to the demagnetisation pin an indication of the magnetisation state of the flyback transformer. A zero voltage detection corresponds to complete core saturation.
9	Synchronisation Input	The synchronisation input pin can be activated with either a negative pulse going from a level between 0.7V and 3.7V to Gnd or a positive pulse going from a level between 0.7V and 3.7V up to a level higher than 3.7V. The oscillator runs free when Pin 9 is connected to Gnd.
10	C_T	The normal mode oscillator frequency is programmed by the capacitor CT choice together with the Rref resistance value. CT, connected between Pin 10 and Gnd, generates the oscillator sawtooth.
11	Soft-Start/Dmax/Voltage-Mode	A capacitor, resistor or a voltage source connected to this pin limits the switching duty-cycle. This pin can be used as a voltage mode control input. By connecting Pin 11 to Ground, the MC44603 can be shut down.
12	RP Standby	A voltage level applied to the RP Standby pin determines the output power level at which the oscillator will turn into the reduced frequency mode of operation(i.e. standby mode). An internal hysteresis comparator allows to return in the normal mode at a higher output power level.
13	E/A Out	The error amplifier output is made available for loop compensation.
14	Voltage Feedback	This is the inverting input of the Error Amplifier. It can be connected to the switching power supply output through an optical (or other) feedback loop.
15	RF Standby	The reduced frequency or standby frequency programming is made by the RF Standby resistance choice.
16	Rref	Rref sets the internal reference current. The internal reference current ranges from 100µA to 500µA. This requires that 5.0kΩ ≤ Rref ≤ 25kΩ.

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Figure 10-4

10.6 Operating description

The input voltage Vcc(pin 1) is monitored by a comparator with hysteresis, enabling the circuit at 14.5V and disabling the circuit below 7.5V. The error amplifier compares a voltage Vfb(pin 14) related to the output voltage of the power supply, with an internal 2.5V reference. The current sense comparator compares the output of the error amplifier with the switch current Isense(pin 7) of the power supply. The output of the current sense comparator resets a latch, which is set every cycle by the oscillator. The output stage is a totem pole, capable of driving a MOSFET directly.

10.6.1 Start-up sequence

t1: Charging the capacitor at Vcc
C2129 will be charged via R3123 and R3134, C2133 and C2111 via R3129. The output is switched off during t1.

t2: Charging of output capacitors
When the input voltage of the IC exceeds 14.5V, the circuit is enabled and starts to produce output pulses. The current consumption of the circuit increases to about 17mA, depending on the external loads of the IC. At first, the capacitor at the Vcc pin will discharge because the primary auxiliary voltage, coming from winding 7-9 is below the Vcc voltage. At some moment during t2, the primary auxiliary voltage reaches the same level as Vcc. The Vcc voltage is now determinated by this primary auxiliary voltage.

t3: regulation
The output voltage of the power supply is in regulation

t4: overload
When the output is shortened, the supply voltage of the circuit will decrease and after some time drop below the lower threshold voltage. At that moment, the output will be disabled and the process of charging the Vcc capacitor starts again. If the output is still shorted at the next t2 phase, the complete start-and stop sequence will repeat. The power supply comes in a hiccup mode

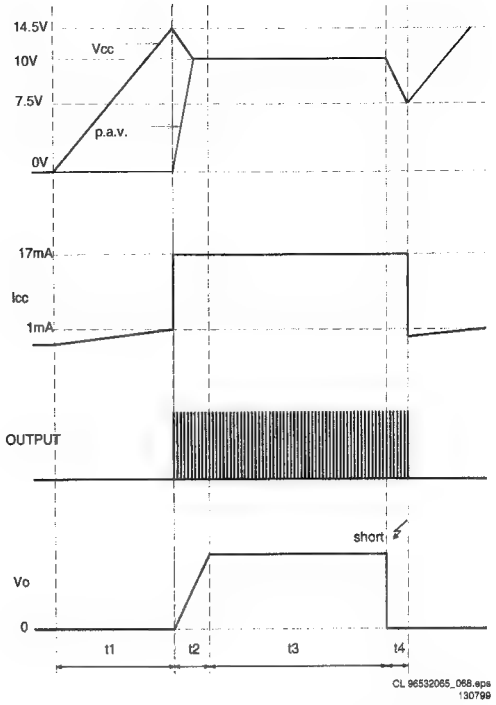


Figure 10-5 Start-up sequence

10.7 Regulation

Figure B shows the most relevant signals during the regulation phase of the power supply.
The oscillator voltage ramps up and down between V1 and V2. The voltage at the current sense terminal is compared every cycle with the output of the error amplifier Vcomp. The output is switched off when the current sense level exceeds the level at the output of the error amplifier.

1. TimeON phase : A drain current will flow from the positive supply at pin 1 of the transformer through the transformer's primary winding, the MOSFET and Rsense to ground. As the positive voltage at pin 1 of the transformer is constant, the current will increase linearly and create a ramp dependent on the mains voltage and the inductance of the primary winding. A certain amount of energy is stored in the transformer in the form of a magnetic field. The polarity of the voltages at the secundary windings is such that the diodes are non-conducting.
2. TimeDIODE phase : When the MOSFET is switched off, energy is no longer supplied to the tranformer. The inductance of the tranformer now tries to maintain the current which has been flowing through it at a constant level. The polarity of the voltage from the transformer therefore becomes reversed. This results in a current flow through the tranformer's secondary winding via the diodes, electrolytic capacitors and the load. This current is also ramp shaped but decreasing.
3. TimeDEAD phase : when the stored energy has been supplied to the load, the current in the secondary windings stops flowing. At this point the drain voltage of the MOSFET will drop to the voltage of C2121 with a ringing caused by the Drain-Source capacitance with the primary inductance.

The oscillator will start a next cyclus which consists of the described three phases. The time of the different phases depends on the mains voltage and the load.
TimeDEAD is maximum at an input of 400VDC and minimum load, it will be zero at an input of 100VDC and overload.

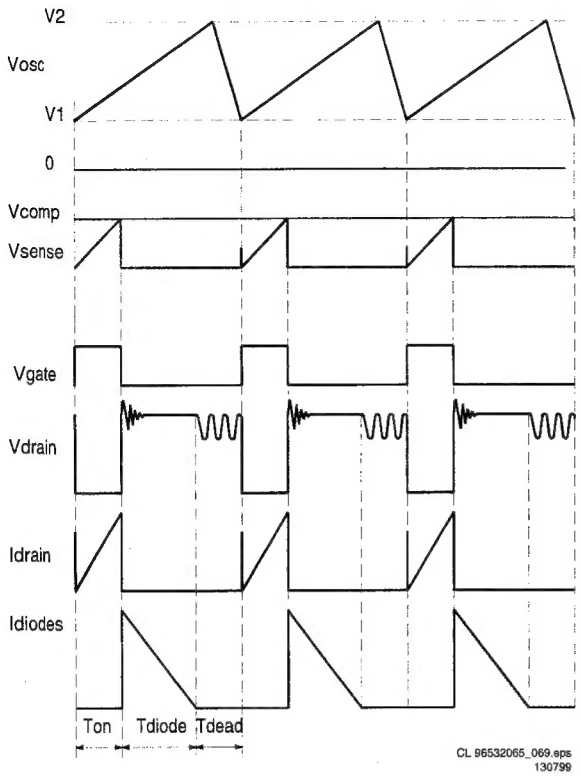
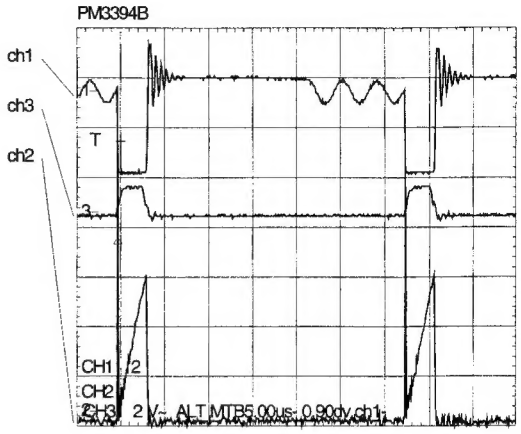
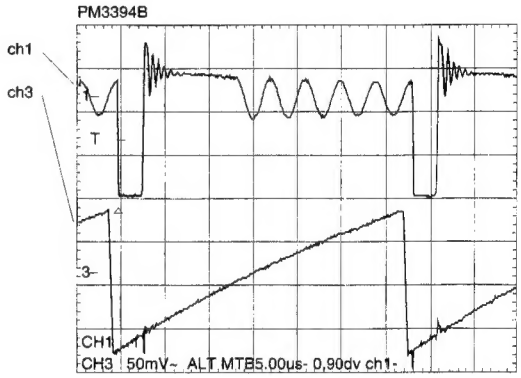


Figure 10-6 Regulation

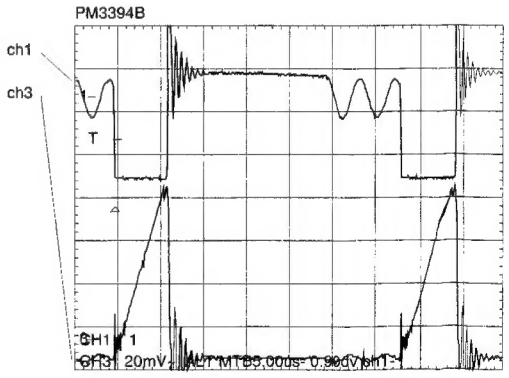
10.8 Oscillograms



ch1 : Drain voltage
ch2 : Drain current
ch3 : Gate voltage



ch1 : Drain voltage
ch2 : Oscillator voltage



ch1 : Drain voltage
ch3 : Sense voltage

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Figure 10-7

11. Circuit descriptions and abbreviations

11.1 Input circuit

The input circuit consists of a lightning protection circuit and an EMI filter.
The lightning protection comprises R3120, gasarrestor 1125 and R3124. The EMI filter is formed by C2120, L5120, C2125 and C2126. It prevents inflow of noises into the mains.

11.2 Primary rectifier/smoothing circuit

The AC input is rectified by rectifier bridge 6120 and smoothed into C2121. The voltage over C2121 is approximately 300V. It can vary from 100V to 390V.

11.3 Start circuit and Vcc supply

This circuit is formed by R3123, R3134, C2129, D6129, R3129, R3111, C2133 and C2111.
When the power plug is connected to the mains voltage, the stabilised voltage over D6129(24V) will charge C2133 via R3129. When the voltage reaches 14.5V across C2111, the control circuit of IC7110 is turned on and the regulation starts. During regulation, Vcc of IC7110 will be supplied by the rectified voltage from winding 7-9 via R3135, D6132 and C2133.

11.4 Control circuit

The control circuit exists of IC7110, C2102, 2104, 2107, 2109, 2110, R3102, 3103, 3104, 3107, 3108, 3109 and 3110. The frequency of the oscillator is defined by C2102 and R3110.
Power switch circuit
This circuit comprises MOSFET 7125, Rsense 3126, 3127 and 3128, R3125 , C2127, L5125, R3112 and R3113. R3125 is a pull-down resistor to remove static charges from the gate of the MOSFET.

11.5 Regulation circuit

The regulation circuit comprises opto-coupler 7200 which isolates the error signal from the control IC on the primary side and a reference component 7201. The TL431(7201) can be represented by two components:

- a very stable and accurate reference diode
- a high gain amplifier

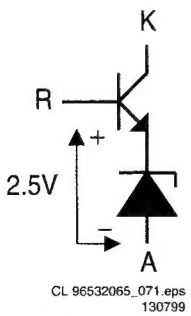

Figure 11-1

TL431 will conduct from cathode to anode when the reference is higher than the internal reference voltage of about 2.5V. If the reference voltage is lower, the cathode current is almost zero.

The cathode current flows through the LED of the opto-coupler. The collector current of the opto-coupler flows through R3106, producing an error voltage, connected to voltage feedback pin 14 of IC7110.

11.6 Demagnetisation

The auxiliary winding (7-9) voltage is used to detect magnetic saturation of the transformer core and connected via R3101 to pin 8 of IC7110. During the demagnetisation phase, the output will be disabled.

11.7 Overvoltage protection circuit

This circuit consist of D6114, C2114, R3115 and R3116.
When the regulation circuit is interrupted due to an error in the control loop, the regulated output voltage will increase (overvoltage). This overvoltage is sensed on the primary winding 7-9.
When an overvoltage longer than 2.0 (s is detected, the output is disabled until VCC is removed and then re-applied. The power supply will come in a hiccup mode as long as the error in the control loop is present.

11.8 Secondary rectifier/smoothing circuit

There are 5 rectifier/smoothing circuits on the secondary side. Each voltage depends on the number of windings of the transformer.
The +5Vstby power supply is derived from the +12Vstby by voltage regulator 7233, C2233 and L5233.
The -5V voltage is regulated by voltage regulator 7259 and will be switched off via D6256, T7256 and T7255 during standby (control signal STAND BY is high). When jumper 4250 is mounted instead of this circuit, a supply voltage -8Vstby will be present at pin 9 of connector 0205. -5V is used in DVD730 MK II, DVD 930 MK II and DVD710. -8Vstby is used in DVD750 and DVD950.
The +5V power supply is derived from +6Vstby by the loader-up circuit formed by MOSFET 7236, reference component 7237, R3236, R3237 and C2239. This voltage will be switched off during STAND BY via T7235.
The 3V3 power supply is regulated by the control loop (7201, 7200, 7110) of the switched mode PSU.

11.9 List of abbreviations

B	Buffered Video input Blue from DVD monoboard
BC_AUX	Blue or Chroma input from AUX-scart
BC_TV	Blue or Chroma output to TV-scart
C_ENC	Buffered Chroma input from DVD monoboard
CVBS	Buffered Composite video input from DVD monoboard
DC_OFF	Control signal to switch off û8Vstby and +12Vstby during standby
DIG_OUT	Digital out
FBIN_AUX	Fast blanking input from AUX-scart
FBOUT_TV	Fast blanking output to TV-scart
G	Buffered Video input Green from DVD monoboard
GIN_AUX	Video input Green from AUX-scart
GOUT_TV	Video output Green to TV-scart
HP_L	Audio output left to headphone and audio scart switch TEA6420
HP_R	Audio output right to headphone and audio scart switch TEA6420
KILL	Kill control signal for audio outputs and for soft mute of DAC
LIN_AUX	Audio input left from AUX-scart
LIN_TV	Audio input left from TV-scart
LOUT_AUX	Audio output left to AUX-scart
LOUT_TV	Audio output left to TV-scart
LRCLK	Left/Right clock
PCM_CLK	Audio system clock for DAC
PCM_OUT0	Audio serial output data
R	Buffered Video input Red from DVD monoboard
RCIN_TV	Red or Chroma input from TV-scart
RCOUT_TV	Red or Chroma output to TV-scart
RIN_AUX	Audio input right from AUX-scart
RIN_TV	Audio input right from TV-scart
ROUT_AUX	Audio output right to AUX-scart
ROUT_TV	Audio output right to TV-scart
SCL	I2C bus clock
SCLK	Audio serial bit clock
SDA	I2C bus data
SELECT	Control signal for video scart switches; high = TV ,low = AUX
SELECT_HIGH	Control signal for switching fast blanking and slow blanking signals; high = TV,.low = AUX
SLB_AUX	Slow blanking control signal from AUX-scart
SLB_TV	Slow blanking control signal to TV-scart
STANDBY	Control signal from STI5505 used to swith off û8Vstby and +12Vstby during standby.
STEREO_L	Audio cinch output left
STEREO_R	Audio cinch output right
Y_ENC	Buffered Luma input from DVD monoboard
YCVBSIN_AUX	Luma or CVBS input from AUX-scart
YCVBSIN_TV	Luma or CVBS input from TV-scart
YCVBSOUT_AUX	Luma or CVBS output to AUX-scart
YCVBSOUT_TV	Luma or CVBS output to TV-scart
0/6/12	Scart switch control signal A/V board. 0V : loop through (AUX to TV), 6V : play 16:9 format, 12V : play 4:3 format

12. Spare parts list

Description	Partnumber	pos
DVDmodule non eur cut 2.1	3104 129 51980	82
Top cover DVD960 Service	MCACAPDVD960SAV	151
Front DVD960 Service	MCAFAVDVD960SAV	1
Tray Front DVD960 Service	MCATFRDVD960SAV	2
Power Supply DVD960	SCRPSUDVD960SAV	1005
Ouput board DVD960 Service	SCROUTDVD960SAV	1001
Keyboard DVD960 Service	SCRKBDDVD960SAV	1002
Flex Foil 16/60	FCANAPPE16-60MM	
Flex Foil 22/60	FCANAPPE22-60MM	
Power switch	MCAINTERDVD9600	1004
Open/Close Key	MCABOUTONDVD960	201
Play/Pause/Stop Key	MCATOUCHEDVD960	202
Legs	MCAPIEDSDVD9600	251-254
remote control	3139 228 81610	
accessory kit	3014 129 21760	

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